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## MAUDE ABBOTT'S OSLER MEMORIALS[1]

When Cushing's Osler appeared, there were voices prophesying that a work of such portentous length would seldom be read from cover to cover, although its author had forestalled this criticism, in some measure, by his modest view of his performance as *mémoires pour servir*. The full length biography, of the type of Boswell's Johnson, Carlyle's Frederick, Thayer's Beethoven or Max Kalbeck's Brahms is, in fact, a reference book or storehouse of information, as well as an authenticated narrative, designed for a certain number of interested readers. Complete and continuous perusal of these major biographies depends, as the mathematicians say, upon "the extent of our interest in the subject." The appearance of Amy Lowell's Keats, close upon the heels of Cushing's Osler, was greeted with intense interest by all genuine admirers of the poet. The successive volumes of Monypenny's Beaconsfield have been followed, line for line, by students of English politics during the Victorian era. But for the general run of readers, biography is undoubtedly more apt to be read in the shape of the single, compact handy volume. As a rule, such biographies have been either conventional, laudatory narratives, beginning with Plutarch's Lives, or frankly scandalous chronicles, as in the back-stairs gossip of Suetonius or Brantôme. The species of British biography defined by Carlyle as "mealy mouthed" is said to have originated with Sprat's Life of Cowley (1668), in which all personal anecdotes, contemporary sidelights and local color are submerged in favor of trite moraliz-

[1] Bulletin No. IX of the International Association of Medical Museums. Sir William Osler Memorial Number. Appreciations and Reminiscences. Montreal, privately issued, 1926.

ing and solemn lapidary pronouncements. In this regard, even Dr. Johnson (Lives of the Poets), although pungent, was not so human and engaging as Aubrey or Izaak Walton. From Forster's Dickens or Stephen Paget's Paré, a long distance has to be travelled before we encounter such an extraordinary specimen of the documented scientific biography as Karl Pearson's Life of Francis Galton. Cushing's Osler, while committed to none of the extravagances of "realistic" biography, is nevertheless a scientific biography—gives us the real man, whether we follow his footsteps continuously throughout the two portly tomes or sense his personality at random by dipping into the narrative *ad libitum*. Dr. Abbott's volume, a kind of pendant to Cushing, is obviously a book for browsing. As being made up of some 117 contributions by various hands, with 69 plates and 31 facsimile reproductions, it is, in an even more definite sense, a collection of *mémoires per servir*, sidelights upon Osler from every conceivable angle.

Following the scholarly *préambules* of Welch and Sir Clifford Allbutt, we find Warthin, Keith, Rhea, McCrae, Maude Abbott and Landis writing on Osler as a pathologist, Libman on his work on endocarditis, Pratt, Knopf, Lawrason Brown and Collier on his tuberculosis activities, Martin Cole, Hare, Lafleur, *et al.*, on his merits as a clinician, Jean Cameron, Ruhräh, Mackall and Streeter on his library and bibliographic affiliations, Cattell and Wilson on his editorial abilities, Gwynn, Todd and Blackader on his early work in natural history, Barker, Howard Kelly, C. P. Emerson, T. R. Brown and many other pupils on his influence upon students, Jacobs, Camac, Thayer, Malloch on his social gifts and capacity of friendship, Adams, Winter, Viets, Norris, Gilcreest and Howard on his wartime activities, while the changing aspects of his many sided personality are facetted in countless reminiscences and anecdotes.

In an offhand collection of this character, there is necessarily some repetition. Some of the most valuable reminiscences, such as those of Dr. Joseph Leidy or Helen MacMurchy's superb, virtually stenographic notation of an Osler clinic, are unfortunately printed in nonpareil type and we miss Singer's important paragraphs on the significance of Osler's work in organizing the study of medical history as an intermediary element in university teaching. Our general impression of the collection is one of polyphony, merging into a massive plagal cadence of universal

affection and reverent esteem. It was Osler's good fortune to be both loved and admired by all and sundry, to win every human vote, wherever and whenever he happened to be in touch with his kind. This is precisely the merit of Dr. Abbott's devoted labors —*der Himmel voll Geigen,* as in some *finale* of Brahms.

Turning now to the reminiscent matter, we glean some vivid sidelights upon the personality of this extraordinary man, beginning with the impressionistic sketch by Sir Arthur Keith:

"Osler's own body and brain were live museums. His body—of medium stature, but ever active—his dark sallow complexion, hair which had been black, but now turning grey, his ample head of the long type; all these are traditional characteristics of the South—the Mediterranean type of man. He was Cornish, with live Celtic fires ablaze in his brain. He saw so deeply into life that he felt the humour of it. There was much of the Will o' the Wisp about him; you put out your mental hand to catch him and he was gone. Never a man masked, so successfully earnestness of purpose and a real love of his fellowmen with a glimmering vein of humour. He was most in earnest when he was most in fun. A future generation will never understand the love which Osler's own generation lavished on him, and the respect in which it held him."

Osler was, in fact, a tropical or meridional personality, like Dieulafoy or Sarasate, of lithe, resilient gait, voice of exquisite *timbre,* warm eyes, clean-cut features, and the forehead of the essential pathologist, the forehead of the elder His or of Victor Cornil. The tradition of a Spanish strain in the South of England and Ireland is, Cushing says, "as old as Tacitus." The effect of such a personality was inevitably a haunting suggestion of the free, open spaces above the dead rattle of life. Dr. C. P. Emerson says: "It was an expression which I have never forgotten. I never saw a face like this"—and goes on to relate how Osler, entering a Parisian clinic, stopped the bedside work in the wards through the intense interest excited by his appearance and personality, although his identity was not disclosed during the brief ten minutes of his visit. Of the Philadelphia period, Hare says that Osler took the students into the post-mortem room "with the joyous demeanour of the youthful Sophocles leading

the chorus of victory after the battle of Salamis," and of the starveling clinical laboratory which he then had: "It was as if Beethoven were playing in a hovel." Of these days, Leidy gives some piquant details. When the students failed to find the focus of infection in an autopsy revealing multiple renal and splenic infarctions, Osler wheeled suddenly upon a culprit with: "You reprobate; you never opened the tympanum!" In another case (melanotic sarcoma of liver and skin), he sang out: "You never examined that choroid membrane!" When Leidy remonstrated with him about his therapeutic nihilism in cardiac cases (his placebo was Compound. Tinct. Cardamon), Osler replied: "Ah Leidy, bless your soul, how many lives will be saved; only, only think of the deaths from the indiscriminate use of digitalis!" And on another occasion: "Well, my dear fellow, if it will ease your mind a bit, put on a poultice." While there is much pother about therapeutic nihilism throughout the book, it is plain that Osler's view of polypharmacy as a "double-edged sword" was sound, as indeed it did anticipate Schmiedeberg's and Cushing's wholesale slashing of the pharmacopœia.

Passing to the clinic, Helen MacMurchy tells of Osler's comment on a student reporting a case of convulsive tic with coprolalia: "You can judge for yourselves how bad the language was from the fact that a medical student noticed that it was bad"; and of his tact in putting an impoverished chlorotic girl at ease before examining her. With the prescription came the inevitable historic note:

> "What shall we give her, Miss T? Yes—Blaud's pills, who was Blaud? . . . Just shows our imbecility as physicians that we have a remedy for chlorosis and plenty of us won't use it. Same thing in malaria; quinine cures malaria and yet we have case after case coming into this hospital, having been treated with everything else."

Marian Osborne tells of Osler's immense popularity with children and of his unusual consideration for the poor. On one occasion he gave first money, then his own overcoat to a seedy old beggar, who was obviously predestined to die of drink and who subsequently bequeathed to young Osler his hob-nailed liver and—the overcoat. With an old Scotch woman, who was making "a devil of a row" before going under operation, Osler tried

a deft *lusingando*: "Poor old Scotch body; thole it a bit, thole it a bit." "O Sir," she cried, "I haven't heard sic a talk since I parted frae Edinboro—Bless you, I maun try to stop from greeting and grizzling." When asked "why do you whistle?" as he left a moribund case, Osler made a grimace and said sadly: "I whistle that I may not weep." We are familiar with Van Wyck Brooks' brilliant exegesis of the case of Mark Twain among the miners—that his subsequent output as a professional humorist was a defensive reaction. Osler's practical jokes were, in Cushing's view, defensive reactions, the tricks which agile minds and keen sensibilities somehow play upon themselves. Burr gives some examples. On one occasion Osler reduced to tears a high-strung lady superintendent, who was desperately smitten with him, by flourishing in her face a skewer, which he had carefully invested with cobwebs, as outstanding evidence of the poor policing of the hospital. He told Burr that he could never become a neurologist unless he mastered Meynert's Psychiatry. When Burr at length reported in despair that he could not comprehend it, there came the twinkling reply: "Do not let that worry you; nobody else can." He chaffed Burr unmercifully about a neurasthenic patient whom he himself declined to see and who subsequently recovered under Weir Mitchell. "Had I not loved him with the love of a hero-worshipper," Burr adds, "I should have hated him, but I did not." The worst of Osler's play-boy impulse was that it engendered a certain amount of trite imitation, nowise grateful to those already fed up with the superiority complex of the average American. The chloroform episode, with such boomerang effects as the impersonation of Osler on the stage (with a jug of chloroform) by Harry Bulger, a brown-eyed Chicago comedian, or the comment of Lady Osler herself ("leading the shattered idols home"), proved *un peu raide*, even for Osler, who had been otherwise game enough when hoaxed on occasion by Welch. Yet nothing more surely reveals the great and thoughtful physician than the main contention of Osler's farewell address of 1905 (The Fixed Period), viz., that "after the sixtieth year, it would be best for the world and best for themselves if men rested from their labors." Thirty years before, Weir Mitchell (in "Wear and Tear") had scored the

city-bred American as a potential neurasthenic through his everlasting concern about business. Dickens, in Chuzzlewit, had even asserted that he is not as busy as he pretends to be. In many an Ade fable, the tired business man, retired from business, finds himself bored to death through his total incapacity to enjoy the fruits of well-earned leisure. Yet no one took these things as seriously as the chloroform joke and the U. S. Army retires its officers at 64. When Osler turned his face to Oxford, he was himself tired to extinction of the exactions and importunities of a huge consultation practice, and with health impaired by a serious attack of influenza, he was perhaps beginning to feel the grasshopper as a burden—

> "Can't one even die in peace,
> As one shuts one's eyes on youth?"

It was at this turn in his life that I began to sense the real Osler. I am thankful to say that I did not find him the aureoled saint of Max Broedel's Johns Hopkins cartoon. "A saint," as Gibbon observed, "is either above or below the present world," and Osler, like Cardinal Newman weeping by the gateside, was intensely human. He reminded me rather of pictures of Sir Richard Burton, whom he resembled slightly *en miniature*. Like Burton, he had undoubtedly tried out all phases of human experience but with the difference that he was able to "hold fast to that which is good" without either hardness or brutality. As a boy, Osler was the traditional clergyman's son, a bit of a *Schlingel*. The mature man had already attained his mental as well as his physical age, was armed in every fibre against illusion and actually dissipated energy in evading the pest of Oslerolatry. His utmost ingenuity was expended upon the lithe perpetual escape from monopolizing bores, even to the extent of ignoring a whole shipful of colleagues to devote himself exclusively to the children on board or travelling incognito, as "Edgerton Y. Davis," whom he impersonated on occasion as a subscriber and contributor to medical periodicals and even carried over Niagara Falls in an obituary notice. When Agnew asked Osler (then a bachelor) why his wife did not come to church, he replied: "Mrs. Osler is a Buddhist." He might have laughed at the story of demon Burton towering above the bewildered curate with such polite small talk as "My father was the most *moral* man I have

ever known'' and ''Nice to be able to think well of one's parents, you know!'' Osler's first manner toward me (a total stranger in a public office) was a thought crabbed (he himself spoke of his ''crabbed Monday morning face'' in the Sargent painting) and my reaction was frankly the Scotch thermodynamic device of ordinary self respect—''lower the temperature.'' Conversing one day in an ordinary tone, he suddenly gripped my shoulder and holding me at arm's length, looked at me fixedly, his eyes filled with tears. I understood, and from that hour have never known, among my elders and betters, a more considerate, sympathetic, thoughtful and inspiring friend. If I mention this anecdote, it is not to thrust myself into the picture, but to illustrate his wonderful power of gripping people to himself as with hooks of steel and making them his friends for life. It is a gift which few of us possess.

It is surprising to learn from some of Dr. Abbott's contributors that Osler's earlier manner in the clinic was halting and uncertain, but this only means that he was truly modest and regarded his subject as more important than himself. In his Beaumont address at the Army Medical School (1894) and in his ringing defense of Congress at the Fletcher banquet in Washington (1906), his delivery was fiery, rapid in tempo, of unfailing surety, and while disdaining oratorical flourishes, carried his audience along and held their attention to the end. The Celtic ring in his voice occasioned the whisper: ''He is Irish.'' But the Celtic strain in Cornwall can be sensed as readily in the steerman's song in Tristan as in the old catch:

> ''And shall Trelawny die? And shall Trelawny die?
> Then twenty thousand Cornishmen shall know the reason why.''

A word as to a slight error in the bibliography. The statement on p. 575 that I delivered the address at the Oxford presentation on June 11, 1919, is obviously erroneous. Even had so great an honor been in any way mine (*salvum sit quod tango*), it was physically impossible, for the reason given by Sir Burke Roche, viz., that ''a man couldn't be in two places at one and the same time, barring he was a bird.'' Jesting aside, the few trifling errata in these splendid memorials will now be corrected in a well-deserved second edition.

F. H. Garrison

# THE SURGERY OF GASTRIC AND DUODENAL ULCER

JOHN M. T. FINNEY, Baltimore

(Delivered before The New York Academy of Medicine, November 4, 1926)

First let us take a hasty glance over our subject touching the high points so to speak, before undertaking a more detailed consideration of those particular phases of it that more intimately concern us as surgeons.

The first description of the pathology of gastric ulcer was published by Baillie in 1793, but inasmuch as it was not accompanied by any clinical data, it had little effect in stimulating interest in the condition. Abercrombie, in 1824, described much of the symptomatology of gastric ulcer, but did not differentiate simple ulcer from ulcerated carcinoma. The credit of having first recognized the difference between ulcer of the stomach, carcinoma and ordinary gastritis belongs to Cruveilhier, who, between 1829 and 1835, published accurate descriptions of the anatomy, the clinical course and the treatment of gastric ulcer. Following Cruveilhier, Rokitansky, in 1839, described the anatomy of the condition, basing his description on 79 cases collected and studied by him. At the time that Dr. Welch wrote his masterly account of "Simple Ulcer of the Stomach" for Pepper's System of Medicine, published in 1885, he found medical literature abounding in articles upon this disease. Some of the more important contributions were those of Gatch on symptomatology and diagnosis, Virchow on etiology, the statistical analyses of Brinton, and the articles of Ziemssen, Leube, Budd, Chambers, Habershon, Fenwick and Fox. Of the enormous number of articles dealing with this condition and published since 1885, very few have advanced materially our knowledge of the pathology of the condition. Due largely to their divergence from commonly accepted ideas, the publications of Wilson and MacCarty have directed attention to the development of carcinoma in simple ulcers. The theory of bacterial origin has received renewed support from the work of Rosenow. The development of surgical technique has increased greatly the extent of surgical treatment, and also has been the basis for the great amount of work on the experimental production and treatment of this condition.

Following their experiments on dogs, Gussenbauer and von Winiwarter, in 1876, had proposed pylorectomy. These experiments of Gussenbauer and von Winiwarten are generally supposed to have been the first recorded operations upon the stomachs of dogs, but such is not the case. Merrem, of Giessen, in a monograph published in 1810 writes as follows:*

"Extirpation of the pylorus. A certain famous professor, highly respected and renowned among the medical profession in Philadelphia, was greatly concerned by the premature death of Dr. Middleton, whose death was caused by the hardening and narrowing of the lower orifice of the stomach. He therefore concentrated his attention on the most effective remedy for this very dangerous malady. The terrible sufferings of his beloved friend could not be removed nor even relieved, although the most approved remedies of the time were used. Nothing therefore was left other than to remove the cause of the disease, that is, to extirpate the pylorus. This operation seemed involved in such serious danger, that at the time his friend would not perform it. Two years before he had had experiments made on several dogs, some of them in perfect health, one a puppy, and they all terminated fatally. (I attribute the blame for this to the difficulty of the operation and to lack of surgical skill.) He used the cruciform section, the perpendicular part of it extending from the xiphoid cartilage of the sternum to the umbilical region. The prolapsed intestine was put back in half an hour, the duodenum sheathed in the stomach, the liver often injured, etc., etc.; in the last case, the puppy, he fitted the end of a certain intestine (not named) into the other (intestine) with the thickness of his thumb, so that the gall bladder and the pancreas would necessarily have been broken, or at least obstructed. None of these animals so badly treated lived longer than twenty-four hours afterward. Not deterred by the fatal outcome, I have tried extirpation of the pylorus on several dogs, one of which recovered."

Pean, in 1879, and Rydygier, in 1880, had unsuccessfully attempted the operation on human subjects. Billroth, in 1881, successfully removed a pyloric carcinoma, and his procedure of suturing the remaining portion of the stomach to the duodenum,

* Certain surgical observations of experiments on animals illustrated by facts. Daniel C. T. Merrem. Giessen, 1810.

end to end, became known as the "Billroth I" method. In 1885, he used gastro-jejunostomy to restore continuity following gastric resection. This became known as the "Billroth II" method. In von Hacker's article describing this procedure, the suggestion was made of termino-lateral gastro-jejunostomy, which was subsequently first performed by Kronlein. To this operation and the subsequent slight modifications of its principle have been attached, in turn, the names of von Hacker, Kronlein, von Mikulicz, von Eiselsberg, Hofmeister, Reichel and Polya.

A plastic operation on the pylorus was first performed by Heineke in 1886, followed independently by Mikulicz in 1887. Kocher's end-to-side gastro-duodenostomy following pylorectomy was reported in 1891. Lateral gastro-duodenostomy was suggested by Jaboulay in 1892, and the first report of its clinical application was made by Henle in 1898, who states that Mikulicz had suggested the method. This operation was the precursor of the method of gastro-pyloro-duodenostomy, which was reported by the speaker in 1902, and now known as "pyloroplasty." Dissatisfied with the disturbed physiology presented by the Billroth II group of anastomoses, and by their tendency to cause secondary ulceration, von Haberer, in 1922, and the speaker, in 1924, working independently, reported their experiences with the Billroth I method modified into an end-to-side gastro-duodenostomy.

In Dr. Welch's article of 1885 there are nine pages devoted to the medical treatment of gastric ulcer, with only a short paragraph on surgery devoted largely to the relief of pyloric stenosis. At that time, it was thought that the treatment was entirely medical, but that cicatrization of the ulcer by no means always cured it in the clinical sense. As a result of adhesions and scar tissue contraction, serious disturbances of the function of the stomach might follow the repair, the most important of which was stenosis of the pylorus. Dr. Welch found three successful cases in four recorded attempts at extirpation of a stenosing ulcer of the pylorus. He ventured the opinion that the resection of gastric ulcers which resist all other methods of treatment, and especially those which cause progressive stricture of the pylorus, might be considered as a justifiable operation. He noted, however, as extravagant and unwarrantable the bold suggestion of Rydygier, who advocated exploration and resection of an ulcer from which hemorrhage threatened to be fatal.

It is interesting to compare this with our views to-day, forty years after the beginning of gastric surgery. It would seem as though the greatest influence had been exerted by the tendency to regard every ulcer as a potential carcinoma, and a source of grave danger from hemorrhage, perforation or obstruction. This, combined with the advances made in diagnosis by means of the X-ray, and the establishment of a characteristic clinical syndrome, has led to the use of surgery in ulcers before the stage of cicatrization has been reached, and in ulcers elsewhere than at the pyloric orifice. The idea that the degree of gastric acidity exerts a marked influence on the healing of ulcers has distinguished a group of surgeons who advocate extensive resection of the stomach beyond the ulcer area from those surgeons who are content with more conservative measures. Dr. Welch's ultra-conservative view on the exploration and resection of bleeding ulcers, finds many followers to-day who look upon such a procedure as inferior to the benefit conferred by absolute rest, diet and appropriate medication.

But here, as elsewhere, it will be found that the large majority of surgeons of experience and mature judgment prefer to follow the middle course. Avoiding the two extremes, the one of consistent opposition to any form of operation, as advocated by some internists, and the other, the indiscriminate resection of large portions of stomach wall; suiting the operative procedure to the indications in the individual case, they as a rule make use of the more conservative types of operation, reserving the more mutilating methods for exceptional cases.

The diagnosis of gastric and duodenal ulcer lies largely within the province of the internist, as he is the one who first sees the case, but it is a sine quo non of good surgery that no operation should be performed for this affection, or any other, for that matter, without the surgeon, who has the responsibility of the operation, seeing to it that a careful history has been taken and an exhaustive physical examination made before undertaking any operative procedure. This will eliminate most of the conditions which may present the clinical picture of ulcer and with which it may be confused. Laboratory examinations will prove of great assistance in further eliminating other conditions which may obscure the diagnosis. Roentgen ray examination contributes

much in the diagnosis of gastric disease. When carefully made, the positive or negative evidence thus obtained by the experienced observer is of great value. However, it is not infallible, in fact it may at times be distinctly misleading, and should be considered only as an important link in the chain of clinical evidence. Thus the diagnosis of gastric and duodenal ulcer is based on the careful accumulation and interpretation of information derived from many sources. It is only by this thorough examination in which the heartiest cooperation between the internist and the surgeon is absolutely essential, that the best results, so far as diagnosis and treatment are concerned, are to be obtained.

The four principal complications of gastric ulcer, the first three of which are common to duodenal ulcer, namely, cicatricial contraction in healing, perforation, hemorrhage and malignant changes, do not concern us here, except in so far as the possibility of their occurrence may influence the surgeon in his choice as to the time and type of operation to be performed. When they do occur, the surgeon is faced with some of the gravest abdominal emergencies that he is called upon to meet. Then, the problem is no longer one of dealing with ulcer, but of the best method of controlling hemorrhage or closing a perforation. We will, therefore, dismiss the first three, with the simple statement that a knowledge of their possible development in the course of the life history of an ulcer would naturally influence the surgeon in favor of early operation, since preventive measures against catastrophes such as these are always far more effective than the remedies applied after they have occurred. The fact, too, that one or more of these grave emergencies may develop, in a considerable percentage of cases of both gastric and duodenal ulcer, weighs all the more heavily in favor of early operation, and in the case of the former, of a more radical one.

Perhaps a brief discussion of malignant transformation in general may help to clarify our minds with regard to the relative importance that should be attached to this possibility in deciding for or against operation. But before doing so, however, and in order to discuss this phase of the subject more intelligently, let us for a moment consider some of the more generally accepted views as to the pathogenesis of ulcer, as influencing to a greater or less extent the surgical treatment of this affection.

The origin and persistence of gastric ulcer has been the source of much speculation and experiment. Most observers agree that the action of gastric juice plays an important part in the development and chronicity of ulcer, but there have been many theories advanced as to the initial and predisposing cause. It is apparent that there is an underlying cause for the origin and persistence of gastric ulcer, aside from the contributing effect of the digestive action of gastric juice. This has been shown experimentally by the fact that when sections of mucosa have been excised, the defects heal rapidly, in the absence of this underlying factor (MacCallum). The action of gastric juice alone is insufficient to inaugurate ulceration in normal gastric mucosa, and is equally ineffective in preventing the rapid healing of artificially produced defects, provided the blood supply is kept intact. It is apparent from abundant experiment, that if one single factor is to be found as the basis for ulcer of the stomach, it must be closely identified with a disturbed blood supply. By analogy with chronic ulcers elsewhere in the body, this contention is borne out. Chronic ulcers elsewhere are the result of some cause acting in a fruitful soil. Even the so-called "trophic" ulcers are usually seen in regions of the body where the blood supply is relatively poor, such as the lower leg, which is a common site for chronic ulcer. Ninety-eight per cent. of ulcers of the stomach and duodenum are located in the region of the pylorus, the posterior part of the lesser curvature, the pyloric antrum and the first portion of the duodenum.* With reference to the blood supply, they are found in that part of the stomach and duodenum supplied by the right gastric artery and the gastro-duodenal artery with its supra-

* "In the year ending June 30, 1921, there were 622 cases of peptic ulcer of the stomach and duodenum, verified by operation at the Mayo Clinic. Of this number, 500, or 80.3 per cent., were duodenal, and 122, or 19.7 per cent., gastric." (W. J. Mayo, Progress in the Handling of Chronic Peptic Ulcer,—Journal A. M. A., Chicago, 1922, LXXIX, 19.)

"Ulcers of the lesser curvature, including those closely associated with the lesser curvature on the anterior or posterior wall comprise almost 90 per cent. of all gastric ulcers." (D. C. Balfour,—Surgical Management of Gastric Ulcer,—Annals of Surgery, 1921, LXXIV, 449.)

Of their 122 gastric ulcers, 110, or 90 per cent., were located in a fairly limited portion of the stomach, a portion roughly defined by the area supplied by the right gastric artery. These, combined with 500 duodenal ulcers, make a total of 610, or 98 per cent., of 622 cases of peptic ulcer.

duodenal branch (Wilkie). There would seem to be some relationship between these two facts. Pursuing the analogy further, one finds a marked relative absence of chronic ulcers of both the stomach and the legs of animals.*

Two marked differences are evident in this comparison of man and the four-footed animals. One is the upright position of man, which may be largely responsible for at least one distinctly human abnormality,—inguinal hernia.†

Another difference is the fact that in man the duodenum is retroperitoneal and largely immobile.

It is quite possible that a vascular arrangement which is sufficient to withstand the effects of various predisposing factors in animals is insufficient to provide a constantly wide margin of safety against similar factors in man.

Dr. W. J. Mayo attributes the preponderance of duodenal ulcers in males over females, partly to an anatomic reason, namely, the fact that the alkaline bile and pancreatic secretion, by reason of the more nearly transverse position in the female, bathe the upper duodenum more constantly.

If we assume that man, because of faulty adaptation of his circulatory apparatus to the upright position, is peculiarly liable to chronic ulcerations in certain parts of the body (the legs and the vicinity of the pylorus) we may possibly be less interested in

* Turck found no gastric ulcers in 189 healthy and 82 diseased dogs. (Journal A. M. A., 1906, XLVI, 1753.)

Mann found none in 200 normal dogs and cats. (Journal Experimental Medicine, 1916, XXIII, 203.)

Ivy found only one acute gastric ulcer in 900 dogs after etherization for laboratory experiment. He noted the great rarity of ulcer in dogs and cats and adds that if gastric juice digestion was a basic factor, we would expect to find more ulcers in dogs than in man, since the dog's acidity is of greater average acidity than man's. He suggests that there may be some factor present in man and absent in the dog which determines the chronicity of the ulcer. (Arch. Int. Med., 1920, XXV, 6.)

† While it is true that inguinal hernia is not unknown in the dog, it has been observed rarely in the boar, the stallion and other male domestic animals. It is remarkable that it does not occur more often, since both the tunica vaginalis and the canal of nuck in this animal remain patent. Hernia in dogs is more common in the female, a fact which Beall attributes to the occurrence of pregnancy. (Beall,—Maryland Medical Journal, 1905, XLVIII, 327, J. H. H. Medical Society.)

the many theories advanced for the initial cause of gastric and duodenal ulcer. There are doubtless many causes of the initial lesion which ultimately develops into a chronic ulcer. If the narrow margin of safety in the human be once encroached upon by some injury to the mucosa, the digestion and erosion by the gastric juice are probably sufficient to develop the chronic ulcer. This conception brings post-operative gastro-jejunal ulcers more closely into relationship with peptic ulcer.

With proper technique, segments of intestine may be resected, opened and implanted into the stomach wall. Provided the blood supply remains intact, the intestinal mucosa survives without ulceration. This indicates that intact living mucosa, other than gastric, resists perfectly the action of digestive juice, and suggests that gastro-jejunal ulcerations are the result of improper technique which endangers the blood supply. By "improper technique" is meant, among other things, the rough handling of tissues, the abuse of clamps in lateral anastomosis, the faulty control of bleeding producing hematomata of the suture line and the development of kinks and adhesions sufficient to impair the circulation of a localized area of intestinal wall.

The theories which have been advanced regarding the initial cause of peptic ulcer may be classified according to whether or not the initial lesion is regarded as inflammatory, neurogenic, circulatory, bacterial or digestive. The principles embodied in these theories have been claimed to act either independently or in combination in producing the acute ulcer and determining its chronicity.

*Inflammatory Theory.*—This was one of the earliest theories advanced and was advocated by Abercrombie and also by Cruveilhier, who was influenced by the evidence of inflammation elsewhere in the stomach. Various degrees of gastritis are frequently found in conjunction with chronic ulcer, but there is no basis for assuming that it may be a cause rather than a secondary result of the presence of the ulcer.

*Neurogenic Theory.*—This theory has had several interpretations based upon the effect produced on the different structures and functions of the stomach. A disturbance of the nerve supply of the stomach has been claimed to account for hypersecretion of gastric juice, hypermotility (spasm) of the musculature,

blood-vessel spasm and "trophic states," all of which have been associated by different authors with the condition of chronic ulceration.

The stomach is innervated both by the vagus nerve and by sympathetic fibers from the coeliac plexus. These nerves approach the stomach through the gastro-hepatic omentum, and after penetrating the muscular coats form the myenteric ganglia. Nicolaysen found these ganglia more profuse in the region of the cardia and near the pylorus. In extensive studies of the nerves adjacent to ulcer of the lesser curvature, both Permans and Nicolaysen found a definite and sometimes marked neuritis and perineuritis, and although they believed this condition to be secondary to the ulcer, they agreed in its probable effect on healing and on gastric motility.

As early as 1828, Cammerer had attempted to produce destruction of the stomach wall by resection of the vagus and the administration of acetic acid. There have been countless reports of experiments involving either the vagus or splanchnic nerves, many of which are contradictory. Ijzeren, in 1901, showed that after section of the vagus, ulcer was not obtained as usual, if a gastro-enterostomy was performed at the same time. Other authors, however, have not consistently observed ulcers following section of the vagus, so these results were not definite, and until Payr's work (he succeeded in producing chronic ulcers) were inseparable from normal healing. Dalla Vedova found ulcers in 41 per cent. of attempts after experimental destruction of the coeliac ganglion, and in 60 per cent. after destruction of the splanchnic nerve. Kobayashi and Kanamura observed multiple erosions of the gastric mucosa not only after pricking or extirpating the coeliac ganglion, but also after section of the spinal cord or ligation of the vagus nerve.

Rost states that if it can be shown that there is not only a definite constitutional weakness in individuals with ulcers, but an actual predisposition of the vessels in the neighborhood of the stomach to cramp, a factor of importance will have been discovered. Unfortunately, the information derived from many conflicting results of work along these lines has been of little value in its application to the treatment of the condition.

*Circulatory Theory.*—As a cause of simple ulcer, local circulatory disturbances with arrest or impairment of the circulation in a circumscribed part of the stomach wall have been supported by the work of many experimenters. The scope of most experiments has extended from attempts to interfere with a localized area of the mucosa, to efforts directed toward the disturbance of the circulation of the entire stomach, both directly and indirectly. Rokitansky was the first to note hemorrhagic necrosis of gastric mucosa, and his observation was followed by Virchow's description of digestion following hemorrhagic infiltration induced by local impairment of circulation. Conditions which may effect the circulation of any part of the stomach wall include embolism and thrombosis, diseases of the vessel wall, such as atheroma, endarteritis obliterans, fatty degeneration, amyloid degeneration, miliary aneurysms and varicose dilatations, compression and obstruction by spasm of the muscular coats of the stomach wall and vaso-constriction of neurogenic origin.

In favor of the circulatory origin of chronic ulcer is the fact that parts of the stomach wall from which the circulation has been shut off are subject to digestion. This is confirmed by the production of ulcers experimentally, after injecting into the gastric arteries substances acting as emboli. Also, hemorrhagic infractions, the hemorrhagic infiltration of acute ulcers, and their frequent funnel-like shape suggests their circulatory origin.

On the other hand, the infrequency of demonstrable changes in the blood vessels about an ulcer, the fact that ulcer occurs earlier than the age when arterial disease is usually present and the absence of ulcer in most cases of heart and arterial disease may be considered evidence against the circulatory theory.

These objections have been met by the contention that the disturbance of the circulation is an intermittent affair, the anatomic demonstration of which is impossible. The circulatory theory is here closely associated with the neurogenic theory in its explanation of the local anemia. As stated above, Klebs supports the idea of local spasmodic contraction of gastric arteries, with temporary interruption of circulation. Orth suggested that compression of the gastric vessels by spasm of the muscular coats of the stomach, occurring in vomiting and gastralgic attacks, results in hemorrhagic infiltrations which may develop into ulcers.

Attempts made to interfere directly with the circulation in parts of the stomach wall include procedures on the larger vessels and on the capillary distribution. Littauer's observations have been confirmed by Ivy, who ligated six to eight branches of the gastro-epiploic vessels supplying the pyloric portion of the stomach, with negative results. Braun demonstrated that four-fifths of the blood supply of the stomach may be cut off without necrosis. Fibich was able to produce chronic ulcers by ligating arteries, excising a portion of mucosa and cauterization of the base. This procedure, however, in the hands of Clairmont did not produce ulcers. An indirect result of these experiments has been the proof that as far as surgical procedures are concerned, the stomach is a very viable organ.

Cohnheim produced ulcers by injecting lead chromate into the gastric artery, and Payr obtained chronic ulcers by injections of formalin, dermatol and India ink. This method of injecting aseptic emboli had been used by Klebs and Welti, and recently by Ivy. Ivy obtained negative results with a bland substance, such as charcoal, and it would seem that Cohnheim's and Payr's work was not illustrative of the effects of purely aseptic emboli, but brought into consideration the actual destruction of tissue. Ulcers may be produced in this manner, which is properly a variety of trauma analogous to Roth's method of injecting silver nitrate solution into the mucosa, or even related to Daettwyler's ulcers produced by mechanical, chemical or thermal irritants applied through a gastric fistula.

The idea that the origin of gastric ulcer depends on diseased conditions of blood vessels is supported by the findings of a comparatively small group of cases. Changes in the blood vessels of the stomach have been seen in a considerable number of cases of gastric ulcer (according to Nicolaysen, 75 per cent.) and gastric ulcer has been recorded in association with most of the diseases to which blood vessels are subject. Examples of embolism of the artery supplying the ulcerated area of the stomach have been reported, but many are open to criticism.

Thrombosis of the vessels about an ulcer has been observed, and in some cases the thrombosis has been prolonged considerable distances beyond the ulcer. Atheromatous changes are not infrequently seen. Obliterating endarteritis, already mentioned,

is probably secondary, similar to that found near tuberculous cavities in the lung. Miliary aneurysms occurring independently or associated with ulcer have been described. In the majority of cases, however, no changes are found in the blood vessels of the stomach except those apparently secondary to the ulcer.

Ever since Virchow attached particular importance to disturbances in the circulation of the stomach in the pathogenesis of ulcer, especial interest has attached to the relationship between gastric ulcer and diseases of the heart and blood vessels. As might be expected, ulcers are found in a small percentage of cases in which blood-vessel changes regularly occur, including atheroma, syphilis, and nephritis. But there are many not so associated, and it will be recalled that the age of onset of gastric ulcer in nearly 70 per cent. of cases is under forty years.

Wilkie demonstrated that the blood vessels of the first part of the duodenum differ greatly from those of the remainder. The superior portion is dependent on a variable branch of the gastro-duodenal artery, which he designated the supraduodenal artery. He also called attention to the scant anastomoses of the terminal portion of the vessels in this region. Berlet recently published his results with injections somewhat similar to Wilkie's. He found the profuse anastomoses of the greater portion of the stomach greatly diminished at the pylorus, and that the actual size of these vessels was small. He concluded that this condition predisposed to circulatory disturbances and was less able to establish compensatory anastomoses in the event of disturbances. This anatomical demonstration of a relatively poor blood supply of this important region of the stomach and duodenum is quite in accord with the idea that the upright position of man always plays considerable part in the pathogenesis of ulcer. Krempelhuber states that anaemia of the mucosa can be brought about purely mechanically by the gastroptosis, which according to him is present in 88 per cent. of cases of ulcer.

*Bacterial Theory.*—Böttcher early advocated the theory that stomach ulcers were of infectious origin. The rôle of bacteria has been considered twofold, embolic and toxic. The embolic theory leads again to the idea of local circulatory disturbance, while the toxic assumes a specificity against gastric mucosa comparable to the gastro-toxin of Bolton. Many bacteria have been

described as the causal agents of ulcer, but for the most part they have been considered secondary. Intravenous injections of different bacteria have yielded no constant results. Bolton was convinced that the commonest cause of necrosis of the mucous membrane, resulting in acute ulcer, is bacterial infection through the blood stream and that the necrosis was due to direct effect on the tissues of bacterial poison alone or combined with the action of gastric juice.

A most significant and interesting work has been that of Rosenow, of the Mayo Clinic, who has shown the selective affinity of streptococci, which are capable of reproducing lesions peculiar to the particular strain. Rosenow's summary of his work in 1916 was as follows: "The ulcers produced by the injection of streptococci resemble those of man in location, gross and microscopic appearance, and in that they tend to become chronic, perforate or cause a severe or fatal hemorrhage. Streptococci having a characteristic affinity for the stomach and duodenum have been repeatedly isolated from various foci of infection in patients with ulcer and from ulcers themselves. They tend to disappear from the circulation and do not commonly produce marked lesions otherwise. They have been isolated from ulcers in animals, and ulcer has again been produced on their re-injection. Filtrates of these cultures have no special tendency to produce ulcer." He states in conclusion: "The small ulcer of the stomach and of the duodenum in man is primarily due to a localized haematogenous infection of the mucous membranes by streptococci." Rosenow's conclusions have not been unreservedly accepted by bacteriologists. Although streptococci are present in practically all gastric ulcers, doubt has been expressed that these organisms have been proven to be the factor which either initiates the ulcer or prevents healing. In spite of this, most surgeons have made practical application of the principle that the treatment of gastric ulcer should be reinforced by a thorough search for and elimination of all possible foci of infection elsewhere in the body, appendix, gall bladder, teeth, tonsils, etc.

*Digestive or Corrosive Theory.*—The importance of the gastric juice in the production and development of ulcers has long held the attention of surgeons. It is now generally thought that gastric juice has little or no part in the initiation of ulceration, but

that its digestive action, after injury to the mucosa, is an important contribution toward the chronicity of the ulcer. It is even probable that these two factors—initial injury and subsequent digestion—if unaccompanied by a continuance of the underlying cause, are insufficient to prevent healing. Without previous injury, the gastric mucosa resists digestion. With ordinary injuries, gastric digestion alone is insufficient to prevent healing. Many attempts have been made to explain this resistance of gastric epithelium. Hunter believed that resistance to digestion is a general property of all living uninjured cells. This would seem to be disproved by the common occurrence of digestion of the skin about a gastrostomy opening. Also, Claude Bernard noted digestion of the thigh of a living frog which was placed in a gastric fistula; and Pavy observed the same effect on a rabbit's ear. Matthes' explanation that the living tissue was killed by hydrochloric acid before digestion took place does not solve the difficulty. Epithelium other than gastric is able to resist this action of hydrochloric acid, which may be properly included in the digestive process. Hanrahan has recently implanted into the stomachs of dogs, resected and opened loops of small intestine, preserving carefully their viability, and has noted superficial erosions in only a small number. The problem apparently deals not with living uninjured tissue as such, but with the explanation of the protective power of alimentary mucosa against gastric digestion. This resistance has been attributed to the presence of mucin in the mucous secretion of the pyloric antrum and to the presence of a so-called antipepsin. The theory, therefore, that the resistance of gastric mucosa against autodigestion is due to the presence of antipepsin and that a diminution of this substance in the stomach wall is followed by ulcer, has not as yet been proven.

The multiplicity of methods by which acute ulcers may be experimentally produced has probably cleared rather than obscured the problem of pathogenesis. Ivy, whose important work has touched on most aspects of the physiology of the stomach, concluded that acute ulcers may be produced by anything that causes a local necrosis by direct, toxic, or chemical action on mucosal cells, or by interfering with or disturbing the normal condition of the capillaries of the mucosa. He classified the chief theories as regards the pathogenesis of ulcers as follows:

1. Infection of the mucous membrane through the blood by specific or non-specific bacteria from a focal infection, is the primary factor and source of re-infection;

2. The corrosive action of gastric juice on mucosal cells that in some way have had their normal resistance against acid-pepsin digestion diminished, prevents healing;

3. Localized trophic disturbance is responsible for chronicity of the ulcer;

4. A general condition of autolysis plays the important rôle.

The peculiarity of stomach ulcers is probably due not to any specific cause, but to the digestive action of the gastric juice, which keeps clean the base and sides of the ulcer. The clean edges and base incident to all ulcers of the stomach justify no conclusion as to the cause of the ulcer. Peptic ulcers probably originate from various causes acting upon favorable tissue—that part of the stomach and duodenum supplied by the right gastric artery and the gastro-duodenal artery, with its supra-duodenal branch. The initial injury is rendered chronic by the continuous erosive action of the gastric juice, which is aided in its effect by adjacent (secondary) neuritis, perineuritis, and obliterating endarteritis. In other words chronic ulcer of the stomach and duodenum is due in all probability not to a single cause acting alone, but to a combination of causes acting more or less together.

*Malignant Transformation.*—First suggested by Cruveilhier in 1829, the tendency of gastric ulcers to become cancerous has been commented on repeatedly by pathologists and surgeons since that time. That ulcer of the stomach may be the origin of carcinoma seems definitely established. It is of considerable importance to the surgeon, inasmuch as his treatment of gastric ulcer must be profoundly influenced by his opinion of the proportion of simple ulcers in which this carcinomatous change may be expected to develop. The surgeon who believes that this proportion is over 50 per cent. will obviously advocate more radical procedures than the surgeon who believes it to be less than 5 per cent.

Cabot and Adie have recently reviewed the trend of opinion on this subject and have shown the fluctuations of surgical opinion on the estimated percentage. From their article it is found that of 82 reports, 74 authors believed that less than 10 per cent. of gastric ulcers develop carcinoma; while 15 authors believe the

frequency to be over 50 per cent. This wide variation indicates that while the tendency is recognized, the criteria on which opinions are based differ greatly. It is of vital importance that these criteria be so established that published reports will have some common basis for comparison. The solution of the problem has been approached by three methods of study:

1. The comparison of the occurrence of ulcers and carcinoma by the statistical method;

2. The study of the history of cases of ulcer and carcinoma with the attempt to differentiate one from the other at some stage. Likewise the study of the life history of ulcer, treated conservatively;

3. The study of the gross and microscopic pathology.

Little of the information gained from any one of these methods may be considered as of positive value. The material may unconsciously be used to support a preconceived idea, which would detract immeasurably from a conclusion which is at best inferential. However, if it is found that the frequency of occurrence as estimated from all of these methods regularly falls near a common figure, we have valuable evidence which would enable us to discount any unusual figures which would be arrived at by the use of only one method of study.

Williams has made extensive use of statistical evidence and regarded it as incompatible with the frequent origin of cancer from ulcer. His conclusions were based on the sex and age incidence and the comparison of the location of ulcer and carcinoma.

Clinical evidence has been furnished by many observers, and there are definite examples reported in which carcinoma has been preceded by a long history of ulcer. A very sound objection to inferences drawn from this is the difficulty not uncommonly encountered of differentiating clinically, gastric from duodenal ulcer. Several authors claim that the transition from simple ulcer to carcinoma is marked by the change from hyperacidity to anacidity, the appearance of a tumor, and cachexia in the course of long observed cases. Lockwood, in 174 cases of gastric carcinoma, found a suggestive history of ulcer in 7 per cent., and definite in 3 per cent. Less than 5 per cent. of carcinomas developed in 346 ulcers of the stomach treated by medical measures and observed by Greenough and Joslin, and by Hemmeter. Jos-

lin later published figures showing that 24 per cent. of the late deaths following operation for gastric and duodenal ulcers were from cancer of the stomach. From studies of the literature Galpern found a small percentage of recurrences in the form of carcinoma, and Gressot places the frequency at 23 per cent. Balfour reports that in 799 cases operated on for gastric ulcer at the Mayo Clinic, 33 or 4.1 per cent. died of cancer during a seven-year period. In 1,610 cases cited by Ewing, the frequency was 2.2 per cent., and this author believes it quite possible that some of these were originally cancer. Ewing states that from clinical evidence it may be concluded that a great number of ulcers have been treated medically for some years without developing cancer; that the number developing cancer after gastro-enterostomy is not appreciably larger than after resection of the ulcer; that a diagnosis of cancer following ulcer, to be acceptable, should carry with it a previous history of ulcer; that this history covers a period of ten to thirty years in certain well attested cases, while in less satisfactory but possibly genuine cases the history of ulcer covers only two years.

The microscopic examination probably accounts for the greatest variation of opinion as to frequency. When the ulcerated primary carcinomas are eliminated, there is left a group of chronic ulcers in whose edges are changes that have been interpreted by some as inflammatory hyperplasia, by others as carcinoma. Wilson and MacCarty are perhaps the chief modern exponents of the latter contention. On the basis of their studies and their interpretation of cellular pathology they have estimated the proportion of ulcers which develop secondary carcinoma as 68 per cent.; and also, the proportion of carcinomata which develop from pre-existing ulcer as 71 per cent. Ewing feels that these inflammatory hyperplasias and misplacements may well be considered as precancerous lesions, but that on the other hand, there is no direct evidence to show that any given precancerous lesion would if undisturbed go on to develop cancer. Indeed, Galpern and Bamberger's observations on the fate of gastric ulcer after gastro-enterostomy seem to prove that these lesions seldom do go on to produce cancer.

While we believe that carcinomatous transformation does not occur in more than 10 or at the most 15 per cent. of gastric ulcers,

there is another more practical phase of the question that is not answered by the academic discussion. The operating surgeon should be able to classify the lesions which Ewing says readily fall into two groups, simple ulcers and primary ulcerated carcinoma. If he is unable to differentiate these, and in addition believes that over 50 per cent. of the former develop secondary carcinoma, he will be consistently radical in his procedures. On the other hand, the surgeon who recognizes and differentiates between simple ulcer and ulcerated carcinoma either from the gross appearance described above, or with the aid of a microscopic pathologist with whose criteria he is in accord, and who does not consider local migratory hyperplasia indicative of cancer, will have little hesitancy in treating simple ulcers conservatively.

The problem may present itself according to what proportion of ulcerated lesions the surgeon is able to identify at the operating table. It is our impression that about 85 per cent. of such cases may be recognized without microscopic aid; that about 10 per cent. more will be identified by means of frozen sections, and that in about 5 per cent. both the surgeon and the pathologist will be uncertain as to their true nature. We do not feel that 70 per cent. of chronic ulcerated lesions unaccompanied by tumor or metastases, are carcinomatous. We feel that about 85 per cent. of simple ulcers are recognizable as such on the basis of chronicity, the character of the edges and base, and the absence of tumor or metastases. Of the remaining 15 per cent., on microscopic examination about 5 per cent. will be found entirely benign; another 5 per cent. will present recognizable carcinoma; while the remainder will require microscopic study of serial sections to ascertain their true character.

*Surgical Treatment.*—The operations usually performed for ulcer of the stomach may be considered as being either conservative or radical. The conservative group may be subdivided into the following procedures: (1) procedures directed toward local excision, cauterization or suture of the ulcer; (2) local excision, etc., plus gastro-enterostomy or pyloroplasty; and (3) gastro-enterostomy or pyloroplasty alone. An operation may be considered radical when the effort is made to remove not only the ulcer, but also that part of the stomach which develops 90 per cent. of ulcers (the so-called ulcer-bearing area of Rodman).

Following this partial gastrectomy, continuity is restored by means of some modification of the principle involved in either the Billroth I or Billroth II anastomoses.

In his choice of operation the surgeon should be wholly influenced by the condition of his patient. The general condition may be greatly affected by such complications as hemorrhage or perforation, with resultant shock, which would restrict the extent of surgical intervention. Such local conditions as dense adhesions or peritonitis might limit the extent of operative procedures. The surgeon, therefore, should be guided directly by the conditions found in the individual case. If a chronic ulcer is operated upon in a quiescent stage, the limitation imposed by the patient's general condition may not be in force. The operative procedure selected will then be determined by the surgeon's opinion regarding the following important considerations: (1) the importance of removal of the ulcer-bearing area of the stomach; (2) the efficacy of the reduction of gastric acidity by a large resection; and (3) the possibility of subsequent carcinomatous transformation.

*Pre-Operative Preparation.*—Previous to all surgical operations upon the stomach, there should always be a period of preliminary preparation, unless, of course, the operation is in the nature of an emergency. It has been our invariable practice for many years to prepare our patients according to a regular routine. In patients so prepared infection has been reduced to a negligible quantity. We prepare our patients as follows:

For several days previous to the operation the patient is instructed to brush his teeth thoroughly with an antiseptic toothpaste and rinse the mouth with a one per cent. carbolic acid solution several times a day. For the same length of time he is kept on a sterile diet, *i.e.*, cooked foods, pasteurized or boiled milk, eggs, orange juice, boiled water, etc. If there is gastric stasis present, lavage once or twice a day, depending upon conditions present, should be employed. Repeated observations by various authors, notably Cushing and Livingood, observations which have been abundantly confirmed by us in cultures taken from both stomach and duodenum upon the operating table, have convinced us that the acid stomach will sterilize itself in approximately forty-eight hours, if no infectious material is meanwhile ingested.

However, this rule does not apply in case of ulcerating carcinoma of the stomach walls. In the latter condition we have recovered various forms of bacteria, especially the streptococcus pyogenes.

The routine comprehensive physical examination of the patient demanded by good surgery should never be omitted, except in case of dire emergency. Starved, dehydrated and exsanguinated patients should be given benefit of the therapeutic measures indicated in the individual case. Fluids should be forced on the patient, and if the gastric condition limits the amount which can be given by mouth, we rely on hypodermoclysis and proctoclysis. Transfusions are given when the percentage of haemoglobin is under sixty.

In the choice of anaesthetic, due consideration should be given to the claims of local as against general methods. More and more is it becoming evident that when properly used, regional nerve block combined with either anterior or posterior splanchnic block yields excellent results. The administration of a general anaesthetic should always be in the hands of the most competent anaesthetist available. The fundamental rules of good surgery, meticulous attention to details, complete asepsis, gentle handling of tissues, absolute haemostasis, and the avoidance of undue haste, should invariably govern the surgeon's every action. When scrupulously observed, they to a marked degree, favorably influence the ultimate result.

*Perforation.*—This complication occurs in about 28.1 per cent. of gastric ulcers, and is responsible for about 7 per cent. of the deaths from this condition as found at autopsy. Of all the catastrophes that require the help of the surgeon few are more urgently insistent in their demands upon his resources than is a perforated gastric ulcer. Not only is the life of the patient seriously jeopardized by the rapidly ensuing peritonitis, but the frequently accompanying shock and agonizing pain demand the earliest possible relief. It is of the utmost importance then, that an early provisional diagnosis be made in order that valuable time may not be lost. The most characteristic feature of acute perforation of a gastric ulcer is a sudden unheralded pain in the epigastrium. This pain is described in various terms by different patients, but all agree upon one point, namely, its extreme severity. The patient lies in one position not daring to move; his body is

tense and rigid; he will not tolerate any manipulation by the examining surgeon, so sensitive is the abdomen, especially over the region of the perforation. The patient usually presents the classical appearance of profound shock, with the single and marked exception that there is little corresponding change in the pulse. Its character and rate are, at first, surprisingly little affected by the perforation, but rapidly change as soon as the resulting peritoneal inflammation becomes well established. But this should never be allowed to occur, unless the patient is out of reach of competent medical help at the time of perforation. Quickness of action is the essence of good management in an emergency of this character. In the presence of the clinical picture just described, neither the doctor nor the surgeon can be held blameless who will allow a moment's unnecessary delay, even to make a positive diagnosis, before opening the abdomen. The real question to be decided is not so much "What has happened?" but rather "Has something sufficiently grave transpired within the abdomen as to seriously threaten, in its consequences, the life of the patient?" If so, it is far safer to open the abdomen immediately, while the patient is still in good condition, rather than run the risk of peritonitis, or hemorrhage, or strangulation, or what not, and so lose the golden opportunity, while waiting to make a finished diagnosis. If err we must, as sometimes we may, let us be sure to err on the safe side. In other words, when in doubt, operate. This is often the more conservative course.

Moynihan's classification of perforation of the stomach into acute, subacute, and chronic types is excellent. All of them are essentially surgical and should be so dealt with, appropriate measures being applied to the individual case. If the ulcer happens to be situated on the anterior wall near the pylorus, as occasionally happens, the operation of choice is a pyloroplasty so modified as to include the ulcer together with its perforation, between the anterior and posterior suture lines, thereby excising the whole area. I have frequently done this in the case of perforating duodenal ulcer and a few times in perforating gastric ulcer situated close to the pylorus, without materially disturbing the regular technique of the pyloroplasty. However, when the perforation occurs along the lesser curvature, as is more often the case, the choice of operation lies between:

1. Suture of the perforation;
2. Suture of the perforation together with posterior gastro-enterostomy;
3. Partial gastrectomy followed by one of the usual methods of gastro-intestinal anastomosis.

Some authorities, Deaver for instance, insist upon closure of the perforation followed by gastro-enterostomy as a routine procedure; while others, headed by Moynihan, practice it only when the exigencies of the case, such as pyloric obstruction or multiple ulcers demand it. The latter course has been our own custom, as it has always seemed advisable to limit the length of time of operation to the minimum, owing to the condition of the patient; and furthermore, the cases in which gastro-enterostomy was not done have seemed to do as well as, or even better than, those in which it was practised.

Certain difficulties will be encountered in the course of the operation. In the first place, the patient will be suffering from more or less shock and collapse as a result of the perforation. Every precaution should be taken to combat this condition with the recognized means at the surgeon's disposal. After the abdomen has been opened, it may not always be easy to find the perforation, even through an incision of ample length which should always be made. The high right rectus incision is the incision of choice. Aids to the location of the ulcer will be the presence of thick masses of fibrinous exudate, or escaping fluids through the perforation in the stomach or duodenal wall. If the perforation does not readily present itself, search should be made in the region where it usually occurs, namely, in the neighborhood of the pylorus along the lesser curvature. As soon as it has been found, that part of the stomach should be gently drawn up into the wound, and isolated from the rest of the abdominal cavity by gauze pads wet with warm salt solution. The perforation and surrounding area are then carefully inspected while the surgeon is determining his subsequent course of action. It should be emphasized that here as elsewhere, every case is a law unto itself. The surgeon's problem is to apply to this particular case that particular form of operative procedure which in his judgment is most suitable to the conditions present. It is bad practice and worse surgery to attempt to adapt any one course

of treatment, no matter how good it may be, to every case. One but courts disaster in pushing any operative procedure beyond its natural limitations. All that will usually be found necessary, after having found the ulcer and cleaned off the deposit of fibrin, is to infold the edges and keep them approximated as best one can by that form of suture most easily adaptable to the conditions found. Personally, where the edges of the ulcer and adjacent walls of the intestine are found to be rigid and indurated owing to oedema and round cell infiltration, the interrupted mattress suture of Halsted has been found most satisfactory, as it includes a better bite of tissue than other types and secures better inversion. The continuous suture, which is easier and quicker than any other, may be reserved for less trying conditions.

It is always well to reinforce the suture line with omentum or with other adjacent and available tissues. Before closing the abdomen, we have made a practice of turning the omentum upward under the liver and between the stomach and the anterior abdominal wall, relying on it to reinforce the suture line still further, and to limit the area of possible infection. The question of drainage is a debatable one. Some authorities advise drainage as a routine practice; others, led by Yates, oppose it. As a general rule, our own inclination is to follow the latter course. Therefore, we seldom drain. There are occasional exceptions, however, particularly in those cases operated upon late, after a peritonitis has become pretty well generalized. It is a good rule to drain thoroughly if one drains at all. This means multiple drains placed in dependent portions as indicated, and brought out through stab wounds in the flanks and above the pubes, or in the case of women, through the vagina. We prefer cigarette drains, two at each point, as two drains act better than one. Others prefer rubber drainage tubes. Early removal of drains is to be encouraged.

Differences of opinion are to be found among surgeons of experience with reference to the toilet of the peritoneum. Authority can be found for almost any method that one may employ. In general it may be said, however, that the same rules with regard to the gentle handling of tissues apply with equal force to the inflamed peritoneum as elsewhere. It is a serious question whether or not more harm than good may be done by attempting

more than the removal of gross particles of food and other material readily accessible. The thing to be feared is the subsequent development of abscess formation arising from the pocketing of pus in various localities. Especially is one to be on one's guard against subphrenic abscess, always a very serious post-operative complication, which should be recognized early, in order that it may be promptly dealt with.

If for any reason it is decided to perform a gastro-enterostomy after having closed the perforation, the same principles should govern as in uncomplicated cases. If on the other hand, owing to the suspicious appearance of the ulcer, or the inability of the surgeon satisfactorily to handle otherwise the problem presented, a partial gastrectomy appears indicated, it differs in no way from the usual method of performance.

We have thus far been dealing with the management of acute perforations. The same principles apply in the case of subacute perforation, the only difference being that, owing to the more minute character of the perforation, there is greater likelihood of finding the infected area walled off by protective adhesions, and a correspondingly decreased extravasation of stomach contents. The problem of the surgeon is therefore simplified to the extent that he is dealing with a localized rather than a generalized process. In the case of the chronic perforation the problem usually resolves itself into the treatment of a perigastric abscess. The methods employed should vary according to the location of the abscess and the other structures involved, *e.g.*, subphrenic abscess, the pancreas, liver, etc.

The post-operative care of these patients is of the utmost importance. It consists in proper posture, the maintenance of the Fowler position, forced fluids by every avenue except the mouth for the first few days; the Murphy drip, subcutaneous and intravenous infusion of normal salt solution, and in extreme cases, blood transfusion. After the first day or two water, crushed ice, and other fluids may be cautiously administered by mouth in gradually increasing quantities. Morphia in sufficient quantity to keep the patient quiet and reasonably comfortable is always indicated. Withholding it, except in case of individual idiosyncrasy is to be condemned.

*Classification of Surgical Treatment.*—The surgical treatment of chronic (non-perforated) peptic ulcer may properly be considered under three main heads:

1. Excision.
   a. Simple excision of the ulcer.
   b. Excision combined with pyloroplasty.
   c. Excision combined with gastro-enterostomy.
2. Gastro-enterostomy.
   a. Gastro-enterostomy alone.
   b. Combined with excision.
   c. Combined with jejunostomy.
3. Resection of a portion of the stomach.
   a. Resection of body (sleeve or wedge).
   b. Partial gastrectomy.
   c. Total gastrectomy.

This classification is obviously quite arbitrary, but it forms a good working basis and is readily understood.

*The Operations for Chronic Ulcer.*—About 90 per cent. of gastric ulcers occur at or near the pylorus or along the lesser curvature, and the danger of stenosis attending simple excision in this location contra-indicates this procedure. Depending on the position and size of the lesion, the operations of choice for the majority of chronic gastric ulcers include pyloroplasty or gastro-enterostomy with excision of the ulcer, and partial gastrectomy followed by gastro-duodenostomy or gastro-jejunostomy. It is obvious that simple excision of ulcers which are located on the anterior or posterior wall of the body of the stomach is probably rarely performed. In addition to the anatomical difficulties presented, the surgeon is doubtless influenced by his desire to perform a more corrective operation.

When the ulcer is located at the pylorus, or in the pyloric portion of the anterior wall, a pyloroplasty presents the advantages of excision of the ulcer, with a reconstruction of the pyloric orifice in such a way that the possibility of stenosis is entirely eliminated. For those to whom this procedure appeals, the Finney pyloroplasty, the Heineke-Mikulicz operation and its modifications, as practised by C. H. Mayo and J. S. Horsley, offer many possibilities. If a pyloroplastic operation is not used, the opera-

tor will probably perform either a gastro-enterostomy with or without excision of the ulcer, or the more radical procedure, partial gastrectomy with restoration by one of the modifications of the Billroth I or II.

If a local excision of a pyloric ulcer is performed, the ensuing closure may obliterate the pyloric orifice, and unless combined with pyloroplasty, as mentioned above, gastro-enterostomy must be performed. Gastro-enterostomy with an obstructed pylorus will, as a rule, give better clinical results than one performed in the presence of a patent pylorus. If the ulcer is not excised, good results may be obtained from gastro-enterostomy, and healing of the ulcer probably takes place in most cases. We do not agree with the high figures quoted by some for carcinomatous transformation. If possible, however, the ulcer should be excised because there is always the possibility that the lesion may be primarily a cancer, or that cancer may later develop.

The radical partial gastrectomy for pyloric ulcer has many advocates. The arguments in favor of this procedure are that it removes the ulcer-bearing area of the stomach (Rodman), and that gastric secretion is diminished by the removal of a large portion of normal gastric mucosa. Advocates of this wide resection feel that the incidence of postoperative gastro-intestinal ulcers is thereby greatly lowered, and also that in capable hands the operative mortality does not exceed the mortality after gastro-enterostomy. When the ulcer is further removed from the pylorus other operative methods are to be employed, depending upon the location of the ulcer, its size and its relation to surrounding structures.

In dealing with ulcers situated along the lesser curvature, several courses are open. Simple gastro-enterostomy or pyloroplasty may be performed or may be combined with local excision of the ulcer, which in this location may be carried out with a wedge- or V-shaped resection. Sleeve or segmental resections have occasionally been used to advantage here. Ulcers situated high on the lesser curvature are perhaps better treated by the more radical partial gastrectomies, or if resection is not done, by gastro-enterostomy followed by jejunostomy as recommended by Moynihan.

Ulcers elsewhere than at the pylorus or on the lesser curvature may more often be treated by simple excision and closure, without the pressing necessity of pyloroplasty, or gastro-enterostomy. Sleeve resections offer some possibilities, but we feel that the cases which may be suitable for this procedure are better treated by partial gastrectomy, followed when possible by the von Haberer-Finney modification of the Billroth I restoration, or by one of the modifications of the Billroth II.

If the ulcer has become adherent to the pancreas, liver, or less rarely the spleen, it may be excised and the base simply cauterized and left in place, and the stomach restored as above. Drainage to this area is usually advisable.

*Discussion of Operations for Gastric Ulcer.*—In considering stomach operations as a whole, we find that they may be divided into two groups based on the type of restoration as compared with normal anatomy and physiology. On the one hand we may have the pyloroplastic operations, and gastro-duodenostomy after partial gastrectomy. In this group of operations the restoration of gastro-intestinal continuity follows the normal arrangement—stomach to duodenum without blind loops. On the other hand, there are the operations depending on the principle of short-circuiting, such as gastro-enterostomy, the Billroth II and its modifications. Following this type of operation, there are two openings from the stomach, also the gastric contents enter the jejunum, which is by nature not well adapted to withstand the effects of gastric juices. Added to this, there is the ever present danger of retrograde filling of the closed loop.

For purposes of discussion we will contrast pyloroplasty with gastro-enterostomy, and gastro-duodenostomy as opposed to the Billroth II and its modifications, as the choice of operation is usually made between these.

*Pyloroplasty vs. Gastro-enterostomy.*—Pyloroplasty as usually carried out eliminates the possibility of pyloric stenosis by the abolition of the pyloric ring. There remains no sphincteric action and the size of the opening from the stomach is limited only by the diameter of the duodenum. After the operation there is a reduction of gastric acidity, brought about by two factors, abolition of pyloric stenosis and the effect of bile and pancreatic juice regurgitated into the stomach. In nearly every case

the total quantity of acid as well as the percentage of free hydrochloric acid, which may be high before operation, is gradually reduced to normal. This does not occur immediately after operation but requires about two months before the normal is established, after which it remains stationary. Hughson found that this gradual reduction of gastric acidity seems to parallel a gradual reduction in the emptying time as observed under the fluoroscope. There is apparently a two-months' interval before the maximum beneficial effect of pyloroplasty is seen, during which careful attention should be paid to the dietary régime.

Gastro-enterostomy is apparently not a drainage operation, but depends for its beneficial effect on the reduction of gastric acidity by regurgitation of alkaline duodenal contents into the stomach. The effect of gastro-enterostomy upon the physiology of digestion has received much attention. Haertel, Schueller, and Petrén showed that in the presence of a patent pylorus the peristaltic wave is unchanged after gastro-enterostomy and that food passes in equal parts through the pylorus and the stoma. Cannon and Blake have shown that unless the stoma is placed very near the pylorus, the gastric contents even when fluid are pushed through the pylorus rather than through the stoma. This work was supported by that of Guibe, Hartman, and Kelling, but disagreed with by Outland, Skinner, and Clendenning, who claimed that gastro-enterostomy is a drainage operation and prevents passage of food through the pylorus. Kelling's work, antedating Cannon's, offers material support to the latter in that after experimental gastro-enterostomy, of 250 cc. of methylene blue in water administered by mouth, 235 cc. were recovered from a duodenal fistula and only 15 cc. from a jejunal fistula. We are able to offer experimental work in support of Guibe, who found that as long as the pylorus remains patent, the stomach has a marked tendency to drive out its contents through that orifice without being inclined to utilize the artificial mouth. Hanrahan has sectioned the duodenum in dogs, in its first part just above the ampulla, and performed gastro-enterostomy on the greater curvature, immediately over the vertebral column. The stoma was four to five cm. in length, but on resumption of feeding was not utilized, with the result that the duodenal blind end in every case was ruptured. Cannon and Blake frequently observed circula-

tion of food but not the symptoms of vicious circle, which is brought about when there is a kink or other obstruction just distal to the anastomosis. The probability of a circulation of food whenever the pylorus is left open, the non-mixture of the food with the digestive and neutralizing fluids in the duodenum, and the ever present danger of kinks are some of the factors contributing to make gastro-enterostomy a not ideal operation.

In pyloroplasty these objections, according to Cannon and Blake, are avoided. Too rapid exit of food through the pylorus is prevented by rhythmic segmentation of food in the duodenum, an activity which in part replaces the function of the pylorus and also mixes food with pancreatic juice and bile.

In addition to its unphysiological aspects, gastro-enterostomy may be attended by the none too rare complication of gastro-jejunal ulceration. We have seen duodenal ulceration follow pyloroplasty in only two instances, probably a persistence of the original ulcers. One appeared after five years, another after one and a half years. In both cases the operation had been performed for duodenal ulcer which we were unable completely to excise at operation. This rarity may of course be explained by the fact that we never use clamps in performing this operation. From experimental work and from clinical observations we have come to the following conclusions regarding the causation of post-operative gastro-jejunal ulcers: (1) while the intestinal mucosa with intact circulation has the general property of resisting gastric juice digestion, there is a slightly increasing susceptibility to this digestion, the farther the anastomosis is made from the pylorus; (2) secondary ulceration occurs most frequently when gastro-enterostomy is performed in the presence of hyperacidity or, more rarely, achylia; (3) the most direct cause of secondary ulceration is faulty technique, such as the improper use of clamps and haemostatic sutures. Montgomery, in 1924, called attention to haematomata in the suture line as a cause of ulceration, and also to the unimportance of the type of suture material.

It is on the basis of a comparison of our results following pyloroplasty with those following gastro-enterostomy that for the reconstruction following partial gastrectomy we advocate the termino-lateral Billroth I type, (the Haberer-Finney method) rather than the Billroth II or its modifications.

We object to the Billroth II group of operations for the same reasons that we object to gastro-enterostomy. To be sure, the incidence of gastro-jejunal ulceration is less than after gastro-enterostomy, but it occurs. Our principal objection is that there is present by these methods the danger of partial obstruction or occasional retrograde filling of the closed loop. If the Scylla of these latter dangers be avoided by the use of entero-anastomosis between the proximal and distal loops of the jejunum, one courts disaster from the Charybdis of secondary jejunal ulceration.

These dangers may be avoided by direct union of the remaining portion of the stomach to the duodenum. This is the principle of the Billroth I. It will be remembered that the Billroth I operation was found to entail what seemed, at the time, too difficult technique, *i.e.*, the union of three lines of sutures, and it was to circumvent this danger that Kocher recommended his method of gastro-duodenostomy, and that in addition to other considerations, led Billroth to advocate his second method. This technical difficulty, however, has, we believe, been solved both by Haberer, who published his results in 1922, and by the speaker, whose report followed independently in 1923. These operators, by thorough mobilization of the duodenum, found that an end-to-side gastro-duodenostomy could be performed in nearly all cases of extensive resections. One may even use this method for a total gastric resection, uniting the cardia to the side of the duodenum. This union is a decidedly more physiological reconstruction than the Billroth II and its modifications, and is to be advised in all cases where sufficient duodenal mobilization can be accomplished to avoid suture strain.

We feel very strongly that an operator should not attempt to force the performance of any one particular type of operation in dealing with gastric or duodenal ulcer. Perforated ulcers should be closed or excised. When located at the pylorus or on the anterior wall near the pylorus, excision may be combined with pyloroplasty. If pyloroplastic operation is not done, gastro-enterostomy is recommended when the patency of the pylorus is diminished or endangered. Perforations away from the pylorus should be excised or closed, or if the condition of the patient permits more extensive surgery, we should recommend partial gastrectomy.

In dealing with chronic ulcers operated upon in a quiescent stage, we prefer pyloroplasty with excision, or partial gastrectomy followed by the Haberer-Finney modification of the Billroth I operation.

*Gastro-enterostomy.*—This important operation was first performed September 28th, 1881, by Anton Wölfler, an assistant in Billroth's clinic. The anastomosis was made between the stomach "a finger-breadth above the insertion of the gastro-colic ligament," and "a loop of small intestine." Credit has been given to Nicoladoni for having suggested gastro-enterostomy to Wölfler, but we have been unable to find any authority for this division of credit.

The untoward result of the second operation performed a few days later by Billroth showed the necessity for suturing the proximal loop of intestine to the stomach in such a way as to prevent kinking and consequent occlusion. In 1883 Courvoisier advocated making the anastomosis retrocolic and with either the duodeno-jejunal flexure, or the first portion of the jejunum. Von Hacker in 1885 perfected the method of making the opening in the transverse mesocolon, so that the danger to the circulation of the transverse colon is minimized. A third method was sponsored by Billroth and Brenner, by which the jejunal loop was brought through openings in both the transverse mesocolon and the gastro-colic ligament and sutured on the anterior surface of the stomach. To prevent regurgitation of duodenal contents Kocher made the incision in the stomach perpendicular to the long axis and curved so as to form a valve-like opening. The valuable adjunct of entero-anastomosis between the afferent and efferent loops of intestine was suggested by Braun and Jaboulay. The object of this procedure was to regulate the conditions of poor circulation in the loops of intestine thus sutured together in such a way that outflow of the contents of the stomach and intestine is assured. This procedure, performed after any gastro-jejunal anastomosis which entails long afferent and efferent loops, has much to recommend it.

Posterior gastro-enterostomy was improved by von Hacker in 1885, Czerny in 1890, and later brought to its present form by the Mayos, Moynihan, and others. To no other operation have there been suggested more modifications than to gastro-enteros-

tomy. These modifications have had to do with the position of application of the jejunal loop, the length, shape and position of the stoma, and the methods of suture. The introduction of the Murphy button gave a decided impetus to gastro-intestinal surgery. It has certain advantages as well as obvious disadvantages. We would not recommend its use as a routine procedure, but occasions may undoubtedly arise in which its use is indicated, although the speaker has never had occasion to use it. It is frequently used by the French (Pauchet), for entero-anastomosis, when speed is essential.

*Billroth I: Haberer-Finney Modification.*—In our hands this procedure has been the logical and inevitable outgrowth of the pyloroplasty operation. It represents an attempt to excise the more inaccessible ulcers in the vicinity of the pylorus, particularly those located posteriorly, and to restore continuity by a form of gastro-duodenal anastomosis which embodies the best features of the pyloroplasty. Some of our more difficult and extensive pyloroplasties with excision, particularly when the ulcer was posterior, suggested that the whole procedure would be much simplified by a pylorectomy, which could be followed by a gastro-duodenostomy, using the entire orifice of the stomach and implanting it into the side of the duodenum whose open end has been closed in the usual manner. This anastomosis is practically our pyloroplasty closure, with the exception that the upper curve of the horseshoe incision has been eliminated by the pylorectomy.

We have repeatedly emphasized our firm conviction that the future great advance in surgery of the stomach will depend largely on the utilization of the principles of mobilization of the stomach and duodenum. Pyloroplasty is to a large extent based on this mobilization, and even more so is this method of gastro-duodenostomy.

In this procedure the pyloric end of the stomach is resected in the usual fashion. The stomach is mobilized in the manner suggested by W. J. Mayo and its open end guarded with a clamp which is allowed to remain in place while the duodenum is prepared. The duodenal stump is closed by whatever method is preferred. We prefer a pursestring suture of silk re-inforced by a number of mattress sutures. Then throughout almost its entire length the duodenum is freely and thoroughly mobilized

by the procedure described above. It will be found that this mobilized duodenum may be turned medianward, and that the orifice of the remaining portion of the stomach may be sutured to the side of the duodenum in exactly the same manner in which a termino-lateral gastro-jejunal anastomosis is made. The closed end of the duodenum lies just above the lesser curvature. It should be placed far enough above the orifice of the stomach so that the inverted end presents no possibility of obstructing the orifice; but not so far that there may be a closed loop.

The duodenum and the open end of the stomach are then united by any form of suture desired. The incision in the wall of the duodenum is made to correspond in length to the diameter of the stomach. If the latter is too large, it may be made smaller by closing as much of the stomach as may be desirable, in the manner advocated by Crile. This step is much the same as the treatment of the stomach end in the typical Billroth I.

After having performed this operation several times, we were interested to find that von Haberer, in Innsbruck, had been using the same method, which he had reported in 1922. Our report was made a year later.

The operation has many advantages as contrasted with the Billroth II and its modifications. Gastric contents are received into the duodenum; there is no danger of retrograde filling of a closed duodenal loop or of a partial proximal duodenal obstruction. The transverse mesocolon is not interfered with nor is there any necessity for an ante-colic anastomosis. The chances of post-operative secondary ulceration are greatly diminished. We have encountered none.

It should be constantly borne in mind that the success of the operation depends wholly upon the satisfactory mobilization of the duodenum. If this mobilization is incomplete, suture strain with its disastrous consequences is inevitable. In certain cases satisfactory mobilization has permitted the use of this method after complete gastrectomy.

To summarize: Since the cause of ulcer is unknown and since its presence is a menace to the comfort and happiness, as well as to the life of the individual, who through its presence, is constantly exposed to the dangers of perforation, hemorrhage, etc., it would appear that resection of the ulcer would be indicated.

This, of course, is no guarantee that it might not recur later. It would appear also that that form of surgical procedure which disturbed least the normal physiological relationship of the stomach, other things being equal, would be the method of choice. Beginning with these two general propositions, therefore, pyloroplasty or gastro-duodenostomy, associated, where possible, with resection of the ulcer, would be the procedure of choice. The particular method of accomplishing this would be determined by the conditions present at operation. The acceptance of these general propositions would relegate to second or third choice the operation of gastro-enterostomy, or extensive gastric resection. I am quite aware that this position is not that held by the majority perhaps of general surgeons, but our experience with all types of operations upon the stomach and duodenum has convinced us that, in our hands at least, the best results, both immediate and late, are secured by the use of these methods. Where for any reason more or less extensive resection of the pyloric portion of the stomach is indicated, gastro-duodenostomy by the Haberer-Finney method, where practicable, is the operation of choice. Extensive resection of the stomach is reserved almost entirely for malignant disease. We are not convinced that the sacrifice of large portions of the stomach wall, interfering as this does with both motor and secretory functions of the stomach, is justifiable as a routine procedure. While in the hands of certain surgeons of skill and experience the results reported have been gratifying, still, in the hands of the average surgeon, the risks of such procedures would appear to contra-indicate their general use.

More important perhaps than almost anything else is the mental attitude of the surgeon in approaching an operation. It is a serious handicap to start in to operate with a fixed determination to do a certain form of operation, no matter what the conditions may prove to be. It is bad judgment and worse surgery to attempt to push any operative procedure beyond its natural limitation. One but courts disaster in so doing. The open mind should be the mind of the surgeon. First to establish the facts, then to employ the particular operation that in his judgment is best adapted to the particular circumstances found. In this way his safety and the best end result.

# SOME ASPECTS OF THE MEDICAL TREATMENT OF PEPTIC ULCER

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It is just as well to remember at the outset that medical treatment of gastric and duodenal ulcer antedates the surgical by several centuries and that it is only within the last 25 years or so that the treatment by surgery has come into extended use. To illustrate how recent it is, the writer saw a patient, in about 1904, with complete pyloric stenosis from ulcer, die in tetany with an enormously dilated stomach. Only a few weeks before, he had been told by no less an authority than the elder Janeway, who was admittedly conservative, that surgical relief for his trouble (presumably gastro-enterostomy) was too hazardous a procedure and that he had better be content to live as long as he could without giving that dubious form of relief further thought. Since then, surgery has made enormous strides, and great honor is due to those whose work has placed certain surgical forms of relief on such sure footing. At the same time, it must be recognized that the tendency in surgery has been steadily in the direction of more and more radical measures. The effect of this policy has been to subject the results to a more searching analysis, and ample evidence is at hand that there is a slow but certain swing of the pendulum toward medical relief, at least, as a thorough preliminary to all surgery, except in the presence of certain types of ulcer and complications.

No longer than ten days ago, a well known surgeon in this place (Academy of Medicine) made the statement that very few ulcers should be treated surgically but that they should almost all be treated medically. This statement, like many of its kind, while perhaps not accurate, only serves to bring to our attention the fact that surgical cures for ulcer often leave much to be desired. There is no doubt, on the other hand, that if one were to take a poll of those in the audience interested in the medical care of these cases, it would show that a large majority are fairly content with their results. That this is a fact will be brought out later.

The task of presenting some aspects of the medical treatment of peptic ulcer is not inconsiderable and one would hardly attempt to do so, were it not for the fact that there is a good deal of difference of opinion as to what the proper medical treatment should be, as there is, as yet, no standard method, but great lack of unanimity on the subject. Some object to the inclusive term "peptic ulcer," but it has long been used to designate these ulcers, whether situated in the stomach or in the duodenum, and, although open to some objection, it is probably as useful as any other name used to describe them.

In attempting to formulate a rational plan of medical treatment, one must be familiar with the etiology of ulceration as found in the stomach and duodenum as far as it is known. At the outset, we are confronted with a lack of specific knowledge of the steps that lead to its formation. When we talk of local interference with the blood supply followed by auto-digestion, we may be quite correct, but there are processes involved of which we know little.

We know that there is an ulcer type of individual, and Draper has shown by his anthropological studies that the vast majority of ulcers occur in people of a certain general physical make-up. These characteristics may be summed up under physical and neurological features. Under the former, one finds the thin individual, tall rather than short, with long face and moderately pointed chin. The anterior dental arch is narrow; the central incisors larger than the lateral; the costal angle acute, with a tendency to abdominal ptosis; in short, the asthenic type of person. This is in marked contrast to the *so-called* gall bladder type, which has almost diametrically opposite characteristics, *i.e.*, shorter, thick set, broad anterior dental diameter, etc.

The neurological characteristics of these ulcer subjects are also more or less typical. They are usually high-strung, active, and often neurasthenic. The opposite qualities characterize the gall bladder type.

While hardly sufficient evidence on which to base a differential diagnosis, these two types are quite distinct, and their recognition very helpful in diagnosis of the border-line case. Of course, these cases overlap, and some gall bladder patients also have ulcer, and vice versa. This is comparatively rare, however, and

I can think of only three such instances in my own experience. So much for the predisposing causes. As to pathological somatic conditions, more or less associated in a causal rôle, we find Smithies' classification helpful, *e.g.*

1. Infections (chronic and acute).
2. Arteriosclerosis.
3. Visceral hypertonia (vagus or splanchnic hyperfunction).
4. Chronic general anemia (so-called "chlorotic").
5. Syphilis.
6. Visceral hypotonia (vagus or splanchnic hypofunction).
7. Postoperative.
8. Industrial intoxication (occupational poisonings).
9. Metabolic dysfunction (thyroid, suprarenal, pituitary, etc.).
10. Trauma.

As to just how these two sets of factors work together toward the formation of ulcer, we are still in the dark, particularly as it is very difficult to find any connecting link that completes the chain. To show what is meant, we have only to think of these same etiological factors of Smithies' as present in numberless other people of a different physical habitus, but who do *not* show the clinical phenomena of ulcer. These factors, then, must all be taken into consideration, not only in making the diagnosis, but in carrying out the details of treatment.

One can leave out of this discussion much in regard to acute ulcer, as all such cases, unless specially complicated, should be treated medically. Even the surgeons, to whom we owe so much of what we know concerning the life history of ulcer, agree to this. It is a fact that such cases do well, for the most part, if carefully dieted and treated by any good method, and this fact has, no doubt, accounted for the many cures designed and advocated by various authorities, each one of which may well gain the desired result in cases of acute ulcer. This is reasonable, for we know that acute ulcers, artificially produced in animals, tend to heal spontaneously, and that it is difficult to produce the persistent and chronic type.

The treatment of chronic peptic ulcer (gastric or duodenal), on the other hand, is a very different matter, and offers many

difficulties, both in the choice of method and concerning the necessity for long-continued supervision.

Some years ago in going over the hospital records of the ulcer cases treated medically, one was struck by the frequency with which these patients returned for subsequent treatment, or whose names were found in the surgical records, as having come to operation.

There is a feeling, more or less general, that unless these hospital patients fall into the hands of internists reasonably interested in the care of such cases, who are willing to pay attention to the more minute details of treatment in the hospital, and who are also willing to follow them up for months afterward with encouragement and advice as to their care of themselves and their diet, many of them do not remain well, although they usually lose their symptoms promptly. This is in contrast to patients who can have every care, and a thoroughly supervised after-cure for months. It is in behalf of the people who spend three or four weeks in a hospital ward, on one or other of the routine dietary methods, but who do not get permanent results, that an especial plea is made.

It may well be argued whether many of these ward cases of chronic ulcer should ever be treated medically (except on account of some adverse associated condition), as they usually have neither the time nor the money to spare on such a necessarily prolonged régime. Even the majority of surgeons agree, however, that in the absence of definite complications, most cases should be given the chance of a medical cure. The reasonableness of this course is emphasized by the considerable number of surgical failures and by the occasional loss of a case from pulmonary or other complications.

Given a case that is to be treated medically, what procedure offers the most favorable chance of cure? In order to arrive at some definite conclusion, the writer followed these two lines of procedure:

1. A questionnaire was sent to all the members of the American Gastro-Enterological Association and a few other gastro-enterologists.

2. A questionnaire was sent to all the patients who had been treated medically, for peptic ulcer, in the wards of one of the

large hospitals of this city, from 1916 to 1924, to determine what proportion of them had remained symptom free. The returns of this second class have come in too slowly to be made a profitable part of the discussion, but will be dealt with in a later paper.

In the first questionnaire, an arbitrary period of two years was taken as representing the probability that the case was cured or arrested if it had gone at least this period symptom free. While, of course, there is no such hard and fast rule, it represents in practice a very fair approximation to the truth.

In analyzing the replies from the first set of questions—that sent out to the members of the Gastro-Enterological Association—many interesting points are brought out. I wish, first of all, to acknowledge my indebtedness to these gentlemen for their courtesy in replying, often at considerable length, and with evident interest. Replies were received from fifty-one men, and as they are all recognized as being among the best gastro-enterologists in the country, the high quality of their replies speaks for itself. As a very conservative estimate, it may be assumed that these men have probably treated an average of 200 cases of ulcer—some many more—but with an average of 200, the results of this questionnaire may be considered as based on approximately 10,000 cases—a large enough series to be of value.

To analyze the questions that were sent out, in detail:

1. What form of treatment do you use?

The answers to this question showed a striking variety of methods; most of the replies were definite, but some rather indefinite, leaving one to draw one's own conclusions. They might be listed somewhat as follows:

| | | |
|---|---|---|
| 1. Duodenal feeding | 4 | 7.0% |
| 2. High fat diet | 2 | 3.5% |
| 3. Sippy diet | 9 | 15.8% |
| 4. Modified sippy diet | 12 | 21.6% |
| 5. Fluids and soft foods with alkalies | 6 | 10.5% |
| 6. Fluids and soft foods without alkalies | 5 | 8.0% |
| 7. Lenhartz | 1 | 1.7% |
| 8. Leube or modified | 4 | 7.1% |
| 9. Bland diet | 7 | 12.5% |
| 10. Medication other than alkalies | 5 | 8.8% |
| 11. Rectal feeding at start | 2 | 3.5% |
| 12. Frequent feedings | (all) | 100.0% |

The most interesting finding disclosed by this report is that by these various diets the results of treatment were all much the same. On seeking for a common denominator, one must reach the inevitable conclusion that there are two factors only that were held by all in common, *viz.*, (1) Frequent feedings and (2) fluid or soft diet at the outset and for a variable length of time. This throws us back to the older treatments of many years ago, except for the fact that then most cases were given rectal feedings at the outset, and often it was as long as 10 to 14 days before mouth feedings were begun, especially in the cases of hemorrhage. Even then, when feedings were begun, they conformed to these two requirements. It makes one a bit skeptical about the value of this or that special form of diet, in the light of this knowledge, and the virulence with which one or another dietary cure is backed by its sponsor seems almost amusing. Nevertheless, it is probable that the different specific forms of diet cure are useful, because the particular form in which a man becomes interested and expert in giving, probably yields the best results in his hands, although no one form can claim any great superiority over the others. The storm center is about the use or not of alkalies, as those who advocate them do so with a good deal of vehemence, while those opposed are equally emphatic. The Sippy diet or some modification of it was used by 37 per cent. of all those who replied. It was also rather noteworthy that only four advocated the duodenal tube feedings. During the war this became a favorite method in the army and was given a good trial. Whether its infrequent use now is because of failures at that time, or just a matter of style—as there are styles in treatment quite as definite as in clothes, it is impossible to say. Only one of the replies favored the Lenhartz diet (modified), so popular ten to fifteen years ago.

Question 2. What proportion of cases after two years are 1st cured, 2nd partially relieved, 3d failures, 4th come to surgery?

When it comes to estimating percentages, we are on very uncertain ground, and no one realizes it more than the writer. At the same time, it would be impossible to get replies if actual statistics were required, so that although the method here pursued is open to grave criticism, it does offer a fair approximation

to the truth, for the errors are more or less equalized and the data furnished have much relative value.

Out of the definite replies, the following percentages of cures were found:

| Type of diet | Cured | Partly relieved | Failures | To surgeons |
|---|---|---|---|---|
| Sippy | 54% | The percentages of cases cured | | 20% |
| Modified Sippy | 54% | and of those that went to sur- | | 16% |
| Duodenal feeding | 64% | geons were the only reliable | | 10% |
| Leube | 60% | figures. The percentages of those | | 10% |
| High fats | 62% | partly relieved or of failures are | | 17% |
| Bland | 48% | not valuable, as some men listed | | 18% |
| Fluids and soft foods with or without alkalies | 34% | the cured cases with those partly relieved and the failures with | | 22% |
| Results of all treatments taken together | 56% | those who went to the surgeons. | | 19% |

These percentages of cure, no matter what method was used, show an inconsiderable variation except in the two middle classes, and seem to emphasize the fact that it probably makes little difference what type of diet is used, so long as it is fluid or soft and that frequent feedings are given. Two of the answers were of interest, (1) that better results of treatment were claimed for women than for men, (2) that it is probable that we do not get as many medical or surgical cures as we think we do.

The results shown in the "partly relieved" column vary greatly, as some men said that no cases were cured but all were relieved and others left out any reference to the percentage relieved.

The number of cases reported as failures ran very evenly for the most part, and those that finally came to surgery also varied little.

3. What is your experience with ambulatory cures?

The replies to this question were very surprising, and the results may be summarized as follows:

| | % |
|---|---|
| (a) Those favorable to it as best or equal to any method | 47 |
| (b) Those who considered it doubtful or less satisfactory | 26 |
| (c) Those who considered it of little or no permanent value | 27 |

In the writer's experience ambulatory cures have not been successful, although practically all patients thus treated lost their

symptoms promptly, for a time at least, but recurrence was the rule. However, putting patients on an ambulatory cure is a useful procedure as a preliminary diagnostic method, for the appendix and gall bladder cases do not respond so well, while the ulcer patients usually become comfortable and practically symptom free in two or three days, unless the ulceration is too extensive.

It has been thought very generally, in the past at least, that rest, both physical and mental, played a large part in the success of a cure, and it does seem difficult to believe that a patient may do as well while up and about carrying on his accustomed activities. Nevertheless, some of the men advocating the ambulatory cure (and they were nearly 50 per cent. of those making replies) are among the best known and most successful gastro-enterologists in the country. They evidently feel that the method is satisfactory at least in their hands. When we come to examine the table of results of ambulatory treatment as reported, we find that the percentage of cured is far below that of the cases treated by rest in bed, which is shown by this table:

| | Cured | To surgeons |
|---|---|---|
| Ambulatory cases | 32% | 18% |
| Treated by rest in bed plus diet | 61% | 14% |

The percentage of cases going to the surgeon shows only a slight difference.

Question 4. What is your impression regarding the frequency of the disappearance of the nitche or other x-ray evidence of ulcer after medical treatment?

The replies to this question were difficult to tabulate, as perhaps it was worded too indefinitely, but the definite answers may be tabulated as follows:

| Gastric | | Duodenal | |
|---|---|---|---|
| Nitche remains | 2.3% | Nitche remains | 18.5% |
| Nitche disappears partly or entirely | 11.6% | Nitche disappears partly | 12.6% |
| Nitche disappears and returns | 6.9% | | |

These figures, of course, refer to the percentage of the answers favoring the disappearance of the nitche or not, and not to the

amount of the nitche's disappearing or remaining. Two of the men felt that all nitches disappear (unless very large) although some return. Others consider that the nitche persists in spite of a clinical cure, and one very careful observer, who, although a clinician, makes his own x-ray examinations, feels that if the nitche does not appear there is a great chance of recurrence. Still another thinks that the gastric nitche often disappears too soon to be an indication of complete healing. Taken altogether, the general consensus of opinion seems to be that the gastric nitche disappears fairly readily, but it may return; that once a duodenal defect is made, it is rarely completely obliterated whether thoroughly healed or not. The whole question, however, shows considerable difference of opinion which undoubtedly is warranted by the diversity of findings.

Question 5. What is your impression regarding the efficiency of hospital ward treatment versus private patient treatment?

Of the forty answers to this question, 77 per cent. find the treatment of private patients more satisfactory, while 23 per cent. feel that the ward cases fare as well or better. This deduction is quite in line with what one would expect, as the private patient is usually able to carry out the treatment more intelligently and to continue longer under medical supervision, both of which factors are of primary importance in effecting a permanent cure. This serves to give force to the statement made earlier in the paper that ward cases do not do as well as they might. The causes of this condition may lie partly in the lack of specific care and partly in the inherent social condition of the patients, less able to spend time and money on what must necessarily be a long period of dietetic care.

Question 6. What degree of pyloric stenosis has been satisfactorily overcome in your experience?

The replies to this question showed almost unanimous response that no case of true organic stenosis is cured by medical means. Some patients are partially relieved of their symptoms, and when there is an underlying cicatricial stenosis with added swelling, round cell infiltration or spasm, these latter features may be relieved by proper diet and lavage, even when they are extreme, resulting in actual gastric stasis. The cases that are due to swelling and spasm only may be entirely relieved by medical treatment.

## Conclusions

Recapitulating the conclusions brought out by this investigation, they may be summarized as follows:

1. The Sippy treatment or some modification of it was used by 37 per cent. of the clinicians.

2. Frequent feedings, and fluid and soft diet were the only common features of all the treatments used, and would, therefore, seem to be the most important factors in bringing about a cure.

3. Rest, and these latter features in the cure, no matter what the specific form of treatment used, gave better results than the same features used in ambulatory cases.

The average percentage of results in all forms of treatment was: Cured, 56 per cent.; to surgery, 19 per cent. The statement was almost unanimously made that success also depended largely on long-continued dietary control.

4. The nitche very frequently disappeared in 52 per cent. of the cases of gastric ulcer, unless too large a pouch had been formed. In some cases the nitche disappeared early. The duodenal nitche rarely, if ever, disappears entirely, although it is usually reduced in size if the progress of the treatment is satisfactory.

5. The results of treatment are better in private patients than in hospital ward cases.

6. Organic cicatricial stenosis is rarely or never cured by medical means, whereas stenosis due to swelling and spasm may be entirely relieved by appropriate diet and treatment, even if it is extreme, resulting in actual gastric stasis.

## *Discussion*

W. W. Palmer

I can heartily agree with what Dr. Carter has said regarding the aspects of the medical treatment of peptic ulcer. In this connection I would like to report, briefly, a case which came under my supervision three years ago.

An unmarried woman of 59, with a severe psychosis who gave a history quite characteristic of gastric ulcer of some 9 months' duration, revealed on physical examination an extreme sensi-

tiveness just above the umbilicus, and on gentle palpation a mass could be made out which was very tender. There was no spasm of the abdominal muscles. The G. I. series revealed a very large, perforating ulcer of the lesser curvature of the stomach. The sac, as nearly as could be made out, was at least 4 cm. long and 3 cm. wide. The temperature was normal, but there was a leucocytosis of 18,000, with a polymorphonuclear count of 70 per cent. On account of the severe psychosis, and since she was to be under close observation, it was decided not to operate immediately, as one is inclined to do, I think, in similar, uncomplicated cases.

On a modified Sippy régime, the symptoms subsided very promptly, the tenderness in the abdomen diminished, and within a month the mass was no longer palpable. An x-ray examination at this time revealed a very much smaller sac, measuring approximately 5 x 8 millimeters. The patient continued to do well, and a third x-ray plate was made in another month when Dr. Golden reported that "the projection on the lesser curvature is so small and shallow that measurements are unsatisfactory." This patient continued free from gastric symptoms for a year, when she died as the result of an accident. An autopsy was performed and the stomach removed. There was still a very small, shallow ulcer, 3 x 5 mm. and 2 to 3 mm. deep.

This illustrates what may be done in instances of this kind with medical care.

Two other cases may be reported which gave similar histories, so far as the progress of the perforating ulcer is concerned. In one case the patient died of carcinoma of the right bronchus, and a healed ulcer of the stomach was demonstrated. In the other case there was shown on x-ray examination a large sac on the lesser curvature at least 5 cm. across the mouth which diminished on medical care within one month to an area of only 3 to 5 millimeters in diameter with normal peristalsis passing over it.

Dr. Carter has emphasized the essentials in treatment, frequent feedings and a bland soft diet. The details of accomplishing this seem to me relatively unimportant. No two cases can be treated in exactly the same manner. In every instance the dietary régime must be adapted to the individual patient.

WALTER A. BASTEDO

I have always had tremendous respect for dear old Dr. Welch, but I have more respect now than ever for the prophetic vision of this famous man since Dr. Finney told us to-night that as long ago as 1885 he allotted eight pages to the medical treatment of ulcer in his book and but one page to the surgical. Dr. Finney says that operation is advisable because of fear of hemorrhage, perforation and change to cancer. I have had more cases of hemorrhage in patients after operation than in all the cases I have treated medically. I have had only two cases with hemorrhage while under my medical treatment and one of these that I had operated upon had a severe hemorrhage two weeks later. I have never had a case of perforation in any case that underwent proper medical treatment, but I have had a number of cases brought to my attention by surgeons, where perforation had occurred after a prior operation and where a gastroenterostomy stoma was normally and properly operating. Aside from the marginal ulcers we have many cases where new ulceration has developed following gastroenterostomy, the most frequently performed operation; that is, in the presence of the condition established to cure an ulcer a new ulcer has developed. That happens over and over again. A case reported to me to-day is one in which perforation had taken place. A gastroenterostomy had been done and recently the ulcer perforated again in the very same place. It is now two years since the primary operation. So surgery is not a sure preventive of hemorrhage and perforation. One radical surgeon recently reported 9 per cent. of mortality in 150 cases. If the most celebrated operators have a mortality of 9 per cent., what is the mortality going to be with the other surgeons who have less experience? Are you going to tell your patient whom you advise to be operated upon that he has a 9 per cent. chance to die from the operation? The surgeon thinks of that 9 per cent. when he himself has an ulcer and does not have an operation.

Then about cancer. We have no evidence that an ulcer healed by medical means is more prone to develop into cancer than the ulcer healed by surgical means. In the ordinary ulcer case we do not act as if in fear of cancer, though we have it in the back of our minds, and such case usually heals under medical treat-

ment. Therefore the claim of surgeons that they alone forestall the development of cancer ten years from now is not well founded. If because of the fear of cancer it were the custom to operate on all cases of gastric ulcer the mortality would be quite high; it would be more than the mortality from cancer that may develop in a possible 5 per cent. of the cases, or even more—though I doubt it. We think we can cure ulcer by medical treatment in the majority of cases, and it seems to me we have no right to advise a patient to have surgical treatment unless we can tell him that the probable dangers and disadvantages are distinctly less than they will be from non-operative procedures.

There is one other point. There are a fair number of cases that are undoubtedly surgical from the outset, and in these cases it is futile and wrong to promise help from medical treatment. But in the other cases we go on and treat them medically and if we fail to get them well we say we will try surgery. I have so often heard this remark at meetings and the audience might get the impression that surgery is sure if medical measures fail. They might then reasonably argue that if surgery is sure why not try that first. But we know that surgery is not sure. It has a high mortality. Dr. Peck reported 8.8 per cent. deaths following gastroenterostomy. Deever's published statistics revealed a mortality of 14 per cent. in gastric ulcer cases within a year of operation. Beckman and White reported 10 per cent. operative mortality with various surgeons of Cincinnati. That is the mortality alone. The morbidity is even higher. Deever reported one case that had undergone four operations for marginal ulcer, and upon whom he was about to perform a fifth operation. Lewisohn reports a similar case that had four operations in six years.

In my opinion therefore certain cases are medical and certain cases surgical; but there is a fairly large group that can be considered surgical only after thorough medical treatment has been tried, and in that group surgery is not by any means successful in 100 per cent. of the cases.

JOSEPH A. BLAKE

The discussion of whether there should be operation or treatment of ulcer medically always interests me. It brings out quite a bit of feeling. I came here tonight to hear Dr. Finney's ideas about the treatment of ulcer. I felt that there was doubt as to the proper treatment. I do not blame the medical men for the stand they take because, as Dr. Finney says, the surgeon has been apt to follow the procedure already arranged in his mind. That has been done with gastroenterostomy and that makes the medical man feel that the surgical treatment of ulcer is unsuccessful. I believe that gastroenterostomy is not the proper operation except under certain conditions. A man should approach an operation with an open mind, without making up his mind previously as to what he is going to do, and should operate on ulcer of the stomach according to the ulcer's character. In recent years I have excised all the ulcers I could and when near the pyloris have done some form of pyloroplasty. I felt that getting rid of the ulcer was the main thing. Whether the ulcer forms again is another matter. Many ulcers undoubtedly do recur; marginal ulcers produced by improper operations, and some others.

There are several things that occurred to me while listening to the discussion this evening. Dr. Bastedo said that the surgeon who has ulcer does not have operation. I wonder how many medical men with ulcer adhere consistently to medical treatment. Some of the medical men who are here to-night have gone to surgeons for treatment. I do not think the question can be cut and dried, but the point I want to make is that the operation hitherto done should not be considered a basis as to what is the best method of treating a given case.

I should like to express my admiration and appreciation of the papers. I have learned more from Dr. Finney's paper to-night than from any I have ever heard, and I have heard a great many.

*Abstract of paper read before the Section of Obstetrics and Gynecology, October 26, 1926*

# THE EFFECT OF ROENTGEN RAYS UPON THE OVARY, AN EXPERIMENTAL AND MORPHOLOGIC STUDY, WITH CLINICAL DEDUCTIONS

M. R. Robinson

Systematic histologic studies of irradiated rabbit ovaries, at weekly intervals, for a period of seven weeks showed that the tertiary follicles are the most vulnerable to the effect of Roentgen rays, and that the ovule is the most sensitive part in the follicle. The primary follicles are not affected by a castration dose and can therefore continue to ovulate as soon as the effect of the irradiation is over, and should impregnation follow irradiation a normal pregnancy and normal offspring may be expected.

The fear that irradiated women will give birth to monsters or mentally defective children has thus far not been substantiated by experimental or clinical facts, and it may therefore be considered as purely hypothetical in nature.

Temporary castration can be accomplished at all ages, the dose is inversely proportional to the age of the female, the older the woman the smaller the dose required. Temporary sterilization should be employed whenever a suspension of ovarian function becomes a clinical indication.

Abortions can be induced with Roentgen rays, and with much smaller doses than is necessary to sterilize. Should the expected abortion not ensue, it becomes imperative to empty the uterus, for fear that a defective child may be born.

The follicular damage sustained from irradiations during pregnancy is far more extensive and involves all the follicles. If permanent castration is not desired at the time of the induction of the abortion, it can be avoided, by irradiating the uterus only.

*Abstract of paper read before the Section of Laryngology and Rhinology, October 27, 1926*

# PREVENTION AND CORRECTION OF NASAL DEFORMITIES FOLLOWING SUBMUCOUS RESECTION

JACQUES MALINIAK

Submucous resection of the septum is one of the commonest nasal operations. In frequency it stands next to tonsillectomy and we can well believe that with the constant increase in specialization, the number of these operations will grow greater.

This fact should be all the more emphasized since aside from the ordinary risks occurring to any surgical intervention, the complications which may follow here are particularly serious because of the possibility of nasal disfigurement. The relation of cause and effect is too evident to the patient to free the rhinologist from blame. What renders the problem very delicate is that a nasal deformity may sometimes result after a submucous resection is done by a skilled rhinologist.

We should, therefore, be inclined to suppose that in certain cases the post-operative nasal disfigurement might be attributed to a specific weakness of the remaining cartilaginous bridge. This might happen especially with delicate women and children. In the latter under a certain age (16 years) a submucous resection might be followed by deformity on account of disturbance in the normal development of the nose. The question of accidental post-operative trauma might also be considered. In the majority of cases, however, the operative technique is at fault.

These deformities are of four types:

1. Retraction of the columella with lowering of nasal tip.
2. Limited dorsal depression.
3. Flattening of the nasal tip.
4. A combination of the latter two.

A careful study of the nasal architecture is necessary to avoid these post-operative complications.

## ANATOMICAL CONSIDERATIONS

*Bony Nose.*—The nasal framework consists of a bony and cartilaginous portion, each of which has a very different role in the

nasal architecture. The osseous portion is firm, immobile and acts as a frame and support for the cartilaginous portion. The nasal bones with the ascending limbs of the maxillary bones are firmly wedged by their upper borders into the opening of the frontal. The strong nasofrontal union is enough in itself to withstand the bending of the nasal bones and could in no way be compromised by a too extensive resection of the perpendicular plate. The latter is in relation above with the lamina-cribrosa and thus becomes important in prophylaxis of possible meningeal complications in the course of a submucous resection. The vomer is in contact with the anterior nasal spine at its antero-inferior end, and this relationship is of great practical importance since it is there that the free border of the quadrangular cartilage, which is the support of the nasal tip, is inserted. In the course of a submucous resection, the thickened and deviated vomer is submitted to a more or less extensive resection and often the neighboring nasal spine is sacrificed in toto. Of necessity, a sinking in of the cartilaginous pillor results with drooping of the tip. The fibro-cicatricial tissue which is formed subsequently increases the retraction of the nasal tip. An economical resection of the nasal spine by paring it off sagittally will avoid the consecutive flattening of the nasal tip.

*Cartilaginous Portion of the Nose.*—The cartilaginous portion is of even greater importance. It is the part which is subjected to all the damage in post-operative deformities. The quadrangular cartilage, wedged into the bony structures mentioned above, ends by its free border above the allar cartilages enclosed in the columella. This free portion of the cartilage is frequently resected during the submucous operation. This should be strictly avoided. On the dorsum, below the nasal bones, the quadrangular cartilage of the septum is continued laterally by the triangular cartilages and unites with them in the median line. These two cartilages thus form a protection for the septum in the median line and serve at the same time for the suspension of the septum by their insertion at the aperture. The thickness and size of these triangular cartilages diminish below and they finally end by diverging from the median line at ½ to 1 cm. above the top of the alar arches. The rhomboidal space thus formed appears in the normally constructed nose as a slight depression situated immediately above the nasal tip.

At this region, the nasal dorsum is formed exclusively by the upper edge of the quadrangular cartilage. This is the *weak spot* of the dorsum and the point of election for post-operative depressions. A high resection of the cartilaginous septum in this region would be necessarily followed by the sinking-in of the remaining bridge. The latter should be at least one half inch high in order to avoid this complication.

*Alar Cartilages.*—The median segments of the alar cartilages are united at the lower border of the quadrangular cartilage and form the columella. The latter does not support the nasal tip on account of the weak structure of these cartilages which do not lean on a bony support. Between them and immediately above passes the free edge of the quadrangular cartilage, which as already mentioned has a solid support on the anterior nasal spine. Its resection will thus be followed by a flattening of the nasal tip.

### Prophylaxis of Indirect Causes

A submucous resection in infected nasal fossae may be followed by infection of the operative cavity, necrosis of the remaining cartilage and sinking of the nose. For the same reason, the cleansing of the operative cavity should be very carefully done and the bony and cartilaginous debris removed before closure of the wound. A resection of a small window on one side of the septal mucosa will insure drainage and may be occasionally indicated. The two plates of the mucosa should be held in place for twenty-four hours by a metal splint, assuring a uniform pressure and avoiding a formation of hematoma. The plugging of the nasal fossae does not do this as well, and besides is accompanied by great discomfort. It is also not without danger to the middle ear. Septal hematoma, if it occurs in spite of all precautions, should be widely opened without delay and the cavity cauterized. Suppuration of the hematoma with disastrous cosmetic results would be thus avoided.

### Correction of Post-Operative Nasal Deformities

Three varieties are presented:

1. Isolated dorsal depressions.
2. Isolated flattening or retraction of the nasal tip.
3. A combination of the two.

Costal cartilage should be used in all cases of nasal reconstruction if it is available. We have used this substance for the last eleven years with success. Once transplanted, the cartilage forms part of the surrounding tissues and continues to live without absorption. Medium sized dorsal depressions are sometimes successfully corrected by auricular cartilage. Costal cartilage is to be used for the correction of more pronounced deformities. It should be removed through a vertical incision of the thorax from the sixth or seventh costal cartilage, avoiding horizontal incision of the muscle fibers, and thereby also avoiding post-operative pain. Bony transplants, from whatever place they are taken, have not given us satisfaction on account of their late absorption.

In patients who refuse to furnish their own cartilage and in pronounced nasal deformities ivory may be used. However, it is preferable to have the nasal dorsum, especially its cartilaginous portion, reconstructed with a yielding living substance like cartilage.

1. The dorsal depression without flattening of the tip should be corrected only by a dorsal transplant. A divided graft, extolled by some for the correction of this deformity, is a mistake on account of the nasal architecture. We have observed artificial angulation and doubtful cosmetic results in cases operated on in this manner.

2. Flattening or retraction of the tip due to an extensive resection of the nasal spine or quadrangular cartilage is to be corrected by transplantation of a cartilaginous support for the columella.

3. The flattening of the tip accompanied by a dorsal depression is corrected by a single angulated transplant. The two fragments, the long one for the dorsum and the short one for the columella, are united at the region of the cut by the perichondrium which corresponds to the nasal tip.

In all this work, the surgeon has to be guided to a great extent by his artistic inclination.

*Abstracts of Paper Read before the Section of Ophthalmology, October 18, 1926*

## CLASSIFICATION OF RETINAL DISEASES: RETINITIS EXTERNA AND CHOROIDITIS

MANUEL URIBE TRONCOSO

A new classification of certain affections of the retina and of the choroid is needed in order to clarify the confusion arising from the use of the terms chorio-retinitis and retinitis. Retinitis as applied indiscriminately to all affections of the retina is a misnomer; a more accurate term, except where there is a distinct evidence of inflammation, would be *retinosis* (Osis-condition of). Affections of the inner layers of the retina would then be classified as *Internal Retinosis.* Those which primarily involve the outer layers and are confined for a long time to that portion of the retina, would be grouped under the heading of *External Retinosis.* When both the choroid and retina are involved, there is chorio-retinitis. When the choroid alone is affected, especially in the early stages of the disease, the term *Choroiditis* is properly applied.

*Pathology of External Retinosis.*—The pathological changes which take place in external retinosis are described as they affect the pigment epithelium, the rods and cones, the lamina vitrea and the optic nerve. The pigment epithelium reacts to injury either by atrophy and complete absorption or by proliferation. When there is complete absorption a pathological tesselation appears, (high myopia, glaucoma, etc.). This is called a superficial depigmentation. Sometimes the breaking down of the cells gives out pigment granules which are dispersed (pepper and salt fundus). When proliferation takes place, the pigment either stays in place or migrates into the inner layers of the retina and is deposited around the small superficial retinal vessels and capillaris, in the typical shape of bone corpuscles, spiders or a lace-like pattern, as are found in the so-called "Retinitis Pigmentosa." To this superficial pigment spots the author gives the name of *Perivascular retinal pigment.* They can be observed also in several forms of external retinosis and in the last stages of chorio-retinitis. The pigment may sheath and cover the

larger vessels or fill a cavity formed in an atrophic area. In the latter case it takes on a round or irregular shape.

The rods and cones also atrophy either as a result of a sclerosis of the chorio-capillaris or of an independent degenerative condition (an abiotrophy) originating in the external layers on the retina. Degeneration may extend to the inner layers of the retina on the one hand and on the other to the choroid itself. The choroid and retina become attached by new connective tissue facilitating a passage of the pigment to the inner retinal layers. In inflammations of the choroid because of the impermeability of the lamina vitrea to cellular exudation and bacteria, the focii remain confined to the choroid and the distinction between choroiditis and external retinosis is, in the beginning at least, well marked.

Colloid excrescenses are seen in some cases of external retinosis, in old cases of choroiditis, and in several other affections. Atrophy of the rod and cone layer produces an ascending degeneration which may involve the ganglion cells, and results in atrophy of the fiber layer and finally of the papilla itself. (Retinitic atrophy.)

*Differential Diagnosis.*—The important diagnostic points between external retinosis and choroiditis are: In external retinosis, there are no signs of active inflammation, nor atrophic white spots; the pigmentation that is present is superficial and perivascular and depigmentation exposes normal choroidal vessels. In choroiditis, however, there are present focii of active inflammation which, in later stages, form white atrophic spots. Pigmentation is in irregular shaped spots and occurs in the deeper layers. Only in the more advanced or in the last stages the pigment migrates to the surface.

The following groups of diseases affecting the outer layers of the retina are included as typical of *External Retinosis*:

1st. Changes due to hereditary syphilis.
2nd. Pigmentary retinosis (non-luetic).
3rd. Pigmentary retinosis without pigment.
4th. Retinosis punctata albescens.
5th. Macular pigmentary retinosis.
6th. Hereditary hyaline infiltration of the retina (Doyne).

The *first group* has three types: (a) Pepper and salt or snuff fundus; (b) Coarse pigment and yellow spots; (c) Pigmentary retinosis of hereditary lues. The *second group* is made up of the primary type of pigmentary degeneration of the retina. This is an external retinosis which starts in the first neuron and then involves the inner layers of the retina. The pigment travels to the surface and deposits around the vessels, which atrophy. The optic nerve also atrophies in later stages of the disease. The early onset of hemeralopia is indicative of the changes which take place in the rods. In the *third group,* the abiotrophy possibly involves both the rods and cones and the pigment epithelium at the same time. The *fourth group*: The functional symptoms and its characteristics warrant its classification with external retinosis.

The *fifth* is a heterogeneous group and includes: (a) central tapeto-retinal degeneration (Leber). (b) Symmetrical macular pigmentary degeneration (Batten & Mayou). (c) Progressive family macular degeneration (Stargardt). (d) Familial retino-cerebral degeneration (Gifford). All these have in common pigmentary changes which on account of the lack of vessels in the macula take the form of round spots. These macular changes may or may not be associated with the degeneration of the brain, and occur in members of the same family. No inflammatory or atrophic foci are observed. The functional symptoms vary from impairment of central vision and day blindness to central scotoma and total blindness. The *sixth group* differs from the types above described only by the progressive character of the white spots, which form large patches.

*Chorio-Retinitis.*—When the changes are not confined to the external layers of the retina but involve the choroid as well, we call them chorio-retinitis. There is a great variety of types, as in fact this is the last stage of all choroidal and retinal diseases. The primary conditions are:

(a) Chorio-retinitis syphilitica (Foerster)
(b) Chorio-retinitis myopica
(c) Chorio-retinitis sympathica
(d) Chorio-retinitis by congenital lues (pseudo-albinism)
(e) Atrophia gyrata (Fuchs)
(f) Photogenus and actinic

Three types are only described: 1st—The Pseudoalbinosis of congenital syphilis in which the depigmentation involves both membranes and there is superficial or perivascular pigment spots.

2nd—The so-called "Secondary retinitis pigmentosa," which is the last stage of many cases of chorio-retinitis, usually from acquired lues.

3rd—The atrophia gyrata choroidea and retinae, of Fuchs.

*Choroiditis.*—In the first stages the inflammation is confined to the choroid alone. This membrane reacts to infection; 1st, by localized foci, 2nd: by diffuse inflammation, 3rd: by vascular degeneration, 4th: endophthalmitis. It is especially in the second and third types that a secondary migration of pigment to the surface of the retina takes place in the cicatricial stages.

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## PROCEEDINGS OF ACADEMY MEETINGS

### Stated Meetings

*November*

Thursday evening, November 4, at 8:30 o'clock

Program presented in cooperation with the Sections of Medicine and Surgery.

ORDER

I. Executive session.
   a. Communication from the Council.
   b. Report of the Nominating Committee.
      Nominations for President, one Vice-President, Treasurer, two Trustees, member of the Library Committee, member of the Committee on Admission.

II. Papers of the evening.
   a. The surgical treatment of gastric and duodenal ulcer, John M. T. Finney, Baltimore (by invitation).
   b. Some aspects of the medical treatment of peptic ulcer, Herbert S. Carter.
   Discussion, Walter W. Palmer, Walter A. Bastedo, Joseph A. Blake.

*The papers of the evening, also discussions, are published in this number of the Bulletin.*

Thursday evening, November 18, at 8:30 o'clock

ORDER

I. Executive session.
Election of Honorary Fellows.
II. The Wesley M. Carpenter Lecture, Ionization and chemical reactions, Michael I. Pupin, Columbia University (by invitation).

## Section Meetings

### *October*

### Section of Laryngology and Rhinology

Wednesday evening, October 27, at 8:30 o'clock

ORDER

I. Reading of the minutes.
II. Presentation of cases.
a. A case of antral sinusitis complicated by radium poisoning, Frederick B. Flinn (by invitation).
b. A case of lung abscess following tonsillectomy, J. D. Whitham (by invitation).
III. Paper of the evening.
The prevention and correction of nasal deformity followlowing submucous resection, Jacques Maliniak (by invitation).
Lantern slide demonstration.
IV. General discussion.
V. Executive session.

*Abstract of the paper by Dr. Maliniak is published in this number of the Bulletin.*

### *November*

### Section of Dermatology and Syphilis

Monday evening, November 1, at 8:15 o'clock

ORDER

I. Presentation of patients.
a. From The University and Bellevue Clinic.
1. Urticaria pigmentosa.

2. Lupus erythematosus.
3. Darier's disease.
4. Lichen planus annularis.
5. Multiple epithelioma (two cases).
6. Erythema elevatum diurtinum.
7. Acrodermatitis chronica atrophicans.
8. Morphea.
9. Tertiary syphilis, severe.
10. Hydroa vacciniforme.
11. Leprosy.
12. Xanthoma diabeticorum.

Howard Fox, Edward R. Maloney, Walter J. Highman, Max Scheer, J. P. Thornley.

b. Cases from Vanderbilt Clinic, and the service of Mihran B. Parounagian, Bellevue Hospital Syphilis Dispensary.

c. Miscellaneous cases.

II. Demonstration of instruments.
Demonstration of the cryo-cautery (Lortat-Jacob), Howard Fox.

III. Discussion.

IV. Executive session.

## Section of Genito-Urinary Surgery

Combined meeting of the Section with the New York Society of the American Urological Association

Wednesday evening, November 3, at 8:30 o'clock

ORDER

I. Reading of the minutes.

II. Presentation of new instruments.
A special catheter for uretero-pyelographic study and aseptic catheterization of the kidney, S. R. Woodruff.

III. Papers of the evening.
a. X-ray therapy in urology, William H. Meyer (by invitation).
b. X-ray in urology, Eugen Joseph, Berlin (by invitation).

IV. Discussion opened by Leon T. LeWald, H. M. Imboden, E. L. Keyes, J. F. McCarthy.

V. Executive session.

## Section of Neurology and Psychiatry

Combined meeting of the Section with the New York Neurological Society

Tuesday evening, November 9, at 8:30 o'clock

ORDER

I. Case presentation.
   A case of multiple dural neoplasms, E. D. Friedman.
II. In memoriam—Charles Bates Dunlap, George H. Kirby.
III. Papers of the evening.
   a. The changing manifestations of the neurses, I. S. Wechsler.
      Discussion by Louis Casamajor, Foster Kennedy.
   b. Encephalitic amyotrophies, August Wimmer, Professor of Psychiatry and Neurology, University of Copenhagen (by invitation).
      Discussion by Smith Ely Jelliffe, J. Ramsay Hunt.

## Section of Pediatrics

Thursday evening, November 11, at 8:30 o'clock

ORDER

I. Reading of the minutes.
II. Papers of the evening.
   a. Essentials in the prevention of tuberculosis in infancy and childhood, S. Adolphus Knopf.
      Discussion by Alfred F. Hess, Adolph G. G. DeSanctis.
   b. The tuberculin skin reactions: a report on the incidence of positive reactions in 3,000 children, Charles Hendee Smith.
III. General discussion.

## Section of Otology

Friday evening, November 12, at 8:30 o'clock

ORDER

I. Reading of the minutes.
II. Case presentation.
   a. 1. Mastoiditis with Gradenigo syndrome before operation.

2. Mastoiditis with Gradenigo syndrome following operation, Jay D. Whitham (by invitation).

b. Case of temporal lobe abscess with hemiplegia and hemianopsis. Recovery.

III. Papers of the evening.

a. Pathology of brain abscess, Joseph H. Globus.

b. Diagnosis and treatment of brain abscess, Walter E. Dandy, Baltimore (by invitation).

IV. Discussion by Charles A. Elsberg, Foster Kennedy, Isidore Friesner, Joseph E. J. King.

V. Executive session.

### Section of Ophthalmology

Monday evening, November 15, at 8:30 o'clock

ORDER

I. Reading of the minutes.

II. Presentation of cases.

a. 1. A case of posterior lenticonus with report of slit-lamp findings.

2. A case of juxta-papillary coloboma of the choroid with unusual vascular arrangement, Elias J. Marsh.

b. A case of detachment of the anterior layers of the iris, Mark J. Schoenberg.

III. Paper of the evening.

On protecting glasses with demonstrations, Joseph Imre, Hungary (by invitation).

### Section of Genito-Urinary Surgery

Tuesday evening, November 16, at 8:30 o'clock

ORDER

I. Reading of the minutes.

II. Presentation of cases.

a. Infarction of the testicle, Samuel Lubash (by invitation).

b. Case for diagnosis, H. L. Wehrbein (by invitation).

c. Stab wound of kidney. Unusual complication, Howard S. Jeck.

III. Paper of the evening.
Post operative results following vasotomy. A study of over seventy cases, Henry L. Kretschmer (by invitation).
IV. General discussion.
V. Executive session.

### Section of Orthopedic Surgery

Friday evening, November 19, at 8:30 o'clock

ORDER

I. Reading of the minutes.
II. Presentation of cases.
a. Meningococcus spondylitis, lumbar. 2 cases (from the Bronx Hospital, Sigmund Epstein.
b. Osteochondritis of the knee joint causing recurrent dislocation of the patella (from Mt. Sinai Hospital), P. William Nathan.
c. Tuberculosis of the spine with paraplegia, treated by fusion (from the N. Y. Orthopedic Hospital), A. DeF. Smith.
d. 1. Congenital dislocation of the hip cured in infancy by author's brace, Charles H. Jaeger.
2. Bifurcation operation for old fracture of femur (from Lenox Hill Hospital), Charles H. Jaeger, Walter I. Galland (by invitation).
e. Bone tumor of radius treated by x-ray (from Bellevue Hospital), Reginald H. Sayre, L. T. LeWald.
f. A case of simultaneous strain of the sacro-iliac and lumbo-sacral joints (from the Hospital for Ruptured and Crippled), Percy W. Roberts.
g. Transplantation of the trapezius muscle for paralysis of the deltoid (from the Hospital for Joint Diseases), Leo Mayer.
h. 1. Pseudo-arthrosis of the forearm cured by tibial inlays.
2. Tibial bone graft peg in ununited fractures of the neck of the femur (from Post Graduate Hospital), Fred H. Albee.

### Section of Obstetrics and Gynecology

Tuesday evening, November 23, at 8:30 o'clock

ORDER

I. Reading of the minutes.
II. Case reports.
   a. An ovarian tumor with theca lutein cell characteristics, A. D'Esepe (by invitation), W. C. Johnson (by invitation).
   b. Spontaneous rupture of a cesarian scar, Hervey C. Williamson.
III. Paper of the evening.
   Etiology and treatment of rectocele, B. P. Watson (by invitation).
   Discussion by G. G. Ward, J. O. Polak.

### Section of Laryngology and Rhinology

Wednesday evening, November 24, at 8:30 o'clock

ORDER

I. Reading of the minutes.
II. Presentation of cases.
   a. Keratosis of vocal cord followed by malignancy, David H. Jones.
   b. Bucco-antral fistula,—closure by plastic procedure, Irving W. Voorhees.
III. Paper of the evening.
   Coagulation time prior to tonsillectomy, Westley M. Hunt.
IV. General discussion.
V. Executive session.

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## THE INSCRIPTIONS ON THE NEW BUILDING

It has been the aim of those interested in the construction of the new Academy to have it a building that would exhibit some special quality of dignity and academic signification. One of the measures—perhaps one might say—minor measures was that of having inscriptions upon the exterior of the building. About

a dozen of these have been placed and the effect is distinctly satisfying. The inscriptions are in Latin. The Latin language, however limited in value in some directions, is universally conceded to be the language for inscriptions; and aside from its special adaptability in this line, it happens that educated men of all races and tongues can read Latin.

I would like to add that there is a real and special art in engraving inscriptions. There often occurs a place where the words or letters must be ingeniously combined or modified in form. For the final effect must be decorative as well as ethically informative, dogmatic, and sound. The decorative effect in the case of the Academy has been obtained, thanks to the painstaking skill of the architect.

The inscriptions for the most part are taken from the writers of the Augustan Age—Cicero, Horace, Virgil and Seneca. Most of the quotations are more or less familiar, but it has seemed worth while to print the text with a translation and this is accordingly done in the following:

*Frieze at 3rd floor*

| | |
|---|---|
| VITA BREVIS—ARS LONGA—EXPERIENTIA FALLAX—JUDICIUM DIFFICILE | Life is short, art is long, experience untrustworthy, judgment difficult. |
| HOMINES AD DEOS NULLA RE PROPIUS ACCEDUNT QUAM SALUTEM HOM. DANDO. ACADEMIA MEDICINAE NOVA EBORACENSIS ANNO DOMINI MDCCCXLIII CONDITA | Men in no way approach so nearly to the gods as in giving health to men |

*In lintels over windows*

| | |
|---|---|
| RES ARDUA VETUSTIS NOVITATEM DARE NOVIS AUCTORITATEM | It is a hard task to give freshness to the old and authority to the new |
| SANTARE ALIQUANDO SAEPE JUVARE SEMPER CONSOLARARE | (The doctor's task is) to cure sometimes, to help often, to comfort always |
| QUI SUI MEMORES ALIOS FECERE MERENDO — UTILIS ILLE LABOR PER QUEM VIXERE TOT AEGRE | Men who by their merit have made others remember them. That useful labor by which so many of the sick have lived |
| ET CAUSAE QUOQUE ESTIMATIO SAEPE MORBUM SOLVIT | A consideration of the cause often explains the disease |
| NULLA UNQUAM DE MORTE HOMINIS CUNCTATIO LONGA EST | There can be no long delay when a man's life is at stake |

| | |
|---|---|
| MELIORA SUNT EA QUAE NATURA QUAM ILLA QUAE ARTE PERFECTA SUNT | Cures made by nature are better than those done by art |
| HOMO QUI IN HOMINE CALAMITOSO EST MISERICORS MEMINIT SUI | The man who is merciful to the afflicted remembers what is due to himself |
| NON IGNARA MALE MISERIS SUCCURRERE DISCO. | Not unfamiliar with misfortune myself I have learned to succor the wretched. |

*Over service entrance*

| | |
|---|---|
| IS EST HONOS HOMINI PUDICO—MEMINISSE OFFICIUM SUUM | It is the highest honor of an upright man to be mindful of his duty |

*Over main entrance*

| | |
|---|---|
| POST MILLE SECULA PRAESCINDETUR OCCASIO ALIQUID ADJUCIENDI | After thousands of ages the opportunity continues of adding to our knowledge |

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## LECTURES AND LECTURERS OF THE PRACTICAL LECTURE SERIES—1927

Jan. 7 The treatment of pneumonia. David Riesman, Philaphia

Jan. 14 General infections by bacteria. Emanuel Libman.

Jan. 21 Obstetrical problems in general practice. John O. Polak

Jan. 28 Clinical aspects of common otological infections. Samuel J. Kopetzky

Feb. 4 Clinical forms of syphilis. George M. MacKee

Feb. 11 Treatment of cardio-vascular syphilis. Harlow Brooks

Feb. 18 Urology for the general practitioner. J. Bentley Squier

Feb. 25 Surgical aspects of medical conditions.

Mar. 4 The diagnosis and treatment of intestinal obstruction. J. F. Erdmann.

Mar. 11 Problems of the first year. Herbert B. Wilcox.

Mar. 18 Common diseases of the eye. John M. Wheeler

Mar. 25 Surgical aspects of diseases of the thyroid. Eugene H. Pool

Apr. 1 Pathological causes of human misconduct. Max Schlapp

Apr. 8 The role of climate in the treatment of tuberculosis. James A. Miller

Apr. 15 Useful drugs in clinical practice. Lewis K. Neff
Apr. 22 Contagious diseases. Shirley W. Wynne

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## PAPERS TO BE PRESENTED AT STATED MEETINGS

Fellows of the Academy who desire to present papers before a stated meeting of the Academy are requested to send the title and a brief abstract of the paper to the Chairman of the Program Committee.

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## HONORARY FELLOWS ELECTED AT A STATED MEETING OF THE ACADEMY, HELD NOVEMBER 18, 1926

Robert Barany, Uppsala, Sweden.
Edward William Archibald, Montreal.
Charles James Martin, London.
Sir George Newman, London.
Sir Charles Sherrington, Oxford.
Henry Head, London.
Marin T. Tuffier, Paris.
George F. I. Widal, Paris.
Josef Jadassohn, Breslau.
Friedrich von Müller, Munich.
Friedrich Neufeld, Berlin.
Vittorio Putti, Bologna.
Carlos Chagas, Brazil.
John Jacob Abel, Baltimore.
Frank Billings, Chicago.
Harvey W. Cushing, Boston.
George E. de Schweinitz, Philadelphia.
George Dock, Pasadena.
John M. T. Finney, Baltimore.
Chevalier Jackson, Philadelphia.
Theobald Smith, Princeton.
William Sydney Thayer, Baltimore.

## RECENT ACCESSIONS TO THE LIBRARY

Ament, W. The mind of the child.
Lond. Simpkin, 1926, 78 p.

Balyeat, R. M. Hay-fever and asthma.
Phila. Davis, 1926, 198 p.

Bartlett, W. The surgical treatment of goiter.
St. Louis. Mosby, 1926, 365 p.

Bazelis, R. Traitement des varices.
Paris. Maloine, 1925, 139 p.

Belfrage, S. H. What's best to eat.
N. Y. Wood, 1926, 2 vols.

Berkeley, C. & Dupuy, G. M. An atlas of midwifery.
N. Y. Wood, 1926, 160 p.

Blake, E. H. Drainage & sanitation. 3. ed.
Lond. Batsford, 1926, 515 p.

Bowley, A. L. Elements of statistics. 5. ed.
Lond. King, 1926, 462 p.

Brockman, C. J. Electro-organic chemistry.
N. Y. Wiley, 1926, 381 p.

Carleton, H. M. Histological technique.
Lond. Oxford pr., 1926, 398 p.

Citelli, S. Malattie del naso e della gola. 2. ed.
Torino. Un. tipo. ed. Torinese, 1926, 686 p.

Collins, J. The doctor looks at love and life.
N. Y. Doran, 1926, 279 p.

Dana, C. L. The peaks of medical history.
N. Y. Hoeber, 1926, 105 p.

Dekker, H. Natural history of the child.
Lond. Simpkin, 1926, 79 p.

Einhorn, M. The duodenal tube. 2. ed.
Phila. Davis, 1926, 206 p.

Elsdon, G. D. The chemistry and examination of edible oils and fats.
Lond. Benn, 1926, 521 p.

Freundlich, H. Colloid & capillary chemistry.
Lond. Methuen, 1926, 883 p.

Gavit, J. P. Opium.
Lond. Routledge, 1925, 308 p.

Guinard, U. Avenir éloigné de la tuberculose pulmonaire.
Paris. Le François, 1925, 191 p.

Hall-Edwards, J. F. Cancer: its control and prevention.
Birmingham. Cornish, 1926, 88 p.

Hamilton, W. I. & Kidner, T. B. Advising the tuberculous about employment.
Balt. Williams, 1926, 171 p.

Handbuch der sozialen Hygiene . . . Hrsg. v. A. Gottstein, [et al.]
Berlin. Springer, 1925–6. 2 vols.

Hanssen, P. Geschichte der Biologie.
Jena. Fischer, 1926, 648 p.

Harmer, B. Methods and principles of teaching . . . nursing.
N. Y. Macmillan, 1926, 136 p.

Head, H. Aphasia and kindred disorders of speech. 2 vols.
Cambridge. Univ. pr., 1926.

Hirsch, C. Lehrbuch der Lokalanästhesie des Ohres und der oberen Luft- und Speisewege.
Stuttgart. Enke, 1925, 293 p.

Hollander, E. Anekdoten aus der medizinischen Weltgeschichte.
Stuttgart. Enke, 1925, 223 p.

Honigmann, G. Geschichtliche Entwicklung der Medizin.
München. Lehmann, 1925, 132 p.

Hutchinson, W. The new handbook of health.
Bost. . . . Houghton, 1926, 410 p.

Ibbotson, W. Surgical operations. 2. ed.
Lond. Faber, 1926, 356 p.

Kahn, F. The cell.
Lond. Simpkin, 1926, 67 p.

Kämmerer, H. Allergische Diathese und allergische Erkrankungen.
München. Bergmann, 1926, 210 p.

Kilduffe, R. A. Bacteriology and applied immunology for nurses.
Milwaukee. Bruce, 1926, 252 p.

Klewitz, F. Lehrbuch der Ernährungstherapie.
München. Bergmann, 1925, 137 p.

Knaggs, H. V. Consumption and tomorrow.
Lond. Daniel co., 1926, 36 p.

Knaggs, R. L. The inflammatory and toxic diseases of bone.
N. Y. Wood, 1926, 416 p.

Knopf, S. A. The medical, social, economic, moral and religious aspects of birth control. 3. ed.
N. Y. Author, 1926, 66 p.

Kolmer, J. A. Principles and practice of chemotherapy.
Phila. Saunders, 1926, 1106 p.

König, J. Nahrung und Ernährung des Menschen.
Berlin. Springer, 1926, 213 p.

Lehrbuch der physiologischen Chemie. Hrsg. von O. Hammarsten. XI. Auf.
München. Bergmann, 1926, 835 p.

Lemay, P. La chimie du bismuth.
Paris. Le François, 1925, 105 p.

Linet, E. La céramique dentaire.
Paris. Maloine, 1925, 166 p.

Loughnane, F. McG. A handbook of renal surgery.
Lond. Longmans, 1926, 210 p.

Marshall, J. A. Diseases of the teeth.
Phila. Lea, 1926, 331 p.

Molliex, P. Précis d'analyse bactériologiques des eaux potables.
Paris. Le François, 1925, 191 p.

New England mutual life insurance company. Life insurance medicine. Vol. I.
Bost. Author, 1926, 219 p.

Nordenskiöld, E. Die Geschichte der Biologie.
Jena. Fischer, 1926, 648 p.

Norton, J. F. & Falk, I. S. Laboratory outlines in bacteriology and immunology.
Chic. Univ. of Chic. pr., 1926, 114 p.

Pagenstecher, E. Die klinische Diagnose der Bauchgeschwülste. Neubearbeitung der ersten Auflage von T. Naegeli.
München. Bergmann, 1926, 487 p.

Paton, D. N. The physiology of the continuity of life.
Lond. Macmillan, 1926, 226 p.

Perrier, C. L'oreille . . . chez les criminels.
Paris. Maloine, 1925, 206 p.

Peruzzi, M. Compendio di anatomia patologica generale e sistematica.
Milano. Hoepli, 1927, 1042 p.

Politzer's text-book of the diseases of the ear. 6. ed., revised by M. J. Ballin.
Lond. Baillière, 1926, 776 p.

Schou, H. I. Religion and morbid mental states.
N. Y. Century co., 1926, 217 p.

Sherman, H. C. Chemistry of food and nutrition. 3. ed.
N. Y. Macmillan, 1926, 636 p.

Siegmund, H. & Weber, R. Pathologische Histologie der Mundhöhle.
Leip. Hirzel, 1926, 330 p.

Starkweather, G. B. Biogenetic marvels . . . 2 vols.
Wash. D. C. Biogenetic pr., 1925.

Stokes, J. H. Modern clinical syphilology.
Phila. Saunders, 1926, 1144 p.

Sudhoff, K. Essays in the history of medicine.
N. Y. Med. life pr., 1926, 397 p.

Transactions of the American association of obstetricians, gynecologists and abdominal surgeons. 1925.

Transactions of the Association of resident and ex-resident physicians of the Mayo clinic. Vol. 6, 1925.

Transactions of the Southern surgical association. 1925.

Transactions of the Western surgical association. 1925.

Vaquez, H. & Donzelot, E. Les troubles du rythme cardiaque.
Paris. Baillière, 1926, 288 p.

Waksman, S. A. & Davison, W. C. Enzymes.
Balt. Williams, 1926, 364 p.

Wenyon, C. M. Protozoology.
N. Y. Wood, 1926. 2 vols.

Whiting, M. H. Ophthalmic nursing.
Lond. Churchill, 1926, 173 p.

Williams, J. F. Text-book of anatomy and physiology for schools of nursing. 2. ed.
Phila. Saunders, 1926, 531 p.

Wood, B. M. & Weeks, A. L. Fundamentals of dietetics.
Phila. Saunders, 1926, 241 p.

Wulkop, E. The social worker in a hospital ward.
Bost. . . . Houghton, 1926, 347 p.

Wyeth, G. A. Surgery of neoplastic diseases by electrothermic methods.
N. Y. Hoeber, 1926, 298 p.

## DEATHS OF FELLOWS OF THE ACADEMY

*Ernest Valentine Hubbard, M.D., M.A.* (Columbia University, 1899), 50 East 63d Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1898; elected a Fellow of the Academy October 5, 1905; died October 24, 1926. Dr. Hubbard was a member of the American Laryngological, Rhinological and Otological Society, a member of the Roosevelt Hospital Alumni Association, a member of the Alumni Association of City Hospital, surgeon at Tonsil Hospital, and throat surgeon at the Manhattan Eye, Ear and Throat Hospital.

*John Van Doren Young, M.D.*, 228 West 71st Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1888; elected a Fellow of the Academy April 6, 1893; died October 25, 1926. Dr. Young was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the Obstetrical Society, a member of the Society of Alumni of St. Luke's Hospital, Consulting Gynecologist at Hackensack Hospital, and Gynecologist at St. Elizabeth Hospital.

*August Matern Sartorius, M.D.*, 42 Liberty Avenue, Jersey City, N. J.; graduated in medicine from Yale Medical School in 1912; elected a Fellow of the Academy November 1, 1917; died November 2, 1926.

*Thomas Madison Taylor, M.D.*, 17 East 42d Street, New York City; graduated in medicine from Bellevue Hospital Medical College, in 1881; elected a Fellow of the Academy April 7, 1904; died November 6, 1926. Dr. Taylor was a Fellow of the American Medical Association.

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## DONATIONS TO THE LIBRARY FUNDS

Donations and bequests are solicited by The New York Academy of Medicine for the maintenance and expansion of the Library.

A donation or bequest of $5,000 or more will provide for a special library fund, the income of which may be used for the general purposes of the Library or restricted to the purchase of books and periodicals, as the donor or testator may indicate. When so restricted, a special bookplate will be used. A donation or bequest of less than $5,000 but more than $1,000 will provide for a named library fund, the income of which will be used for general library purposes or restricted for the purchase of books and periodicals, as desired by the donor or testator.

Donations of less than $1,000 will be added to the general library funds.

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## FORM OF BEQUESTS

The following is a brief legal form as a suggestion under which bequests may be made in behalf of the Academy:

I give, devise and bequeath unto "The New York Academy of Medicine" of the City of New York, State of New York, a corporation duly incorporated by the Legislature of the State of New York by an act, entitled "An act to incorporate The New York Academy of Medicine," passed June 23, 1851, and amended June 4, 1853, June 2, 1877, and April 24, 1925.....

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